"MERCY MIST"—OUR AMAZING SECRET WEAPON

MECHANIX ILLUSTRATED

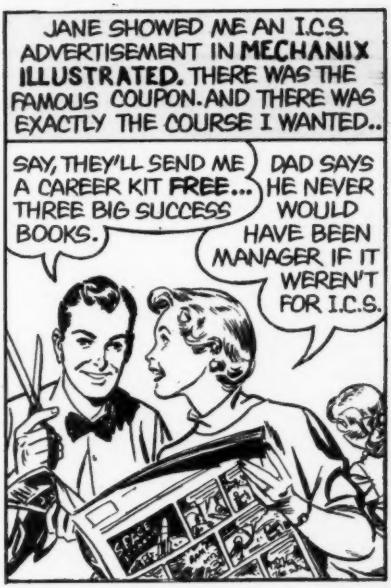
THE HOW-TO-DO MAGAZINE

Best Buy 25c JANUARY

GO KARTS

Race Cars Anyone Can Drive
Plus
Plans For Building Your Own

SKIPPED ME AGAIN!
POOR BURT! HE MISSED OUT ON THAT PROMOTION AGAIN!
I WAS DETERMINED TO MAKE GOOD IN MY JOB...BUT DETERMINATION, I FOUND, WAS NOT ENOUGH!
I HAD PLENTY OF EXPERIENCE. AND THE BOSS SEEMED TO LIKE ME. I LACKED JUST ONE THING- TRAINING!
SORRY, BURT! I KNOW YOU'VE WORKED HERE LONGER. BUT TED HAS THE SPECIAL TRAINING WE NEED. YOUR CHANCE WILL COME ...SOMEDAY!
I. C. S. IS THE OLDEST AND LARGEST CORRESPONDENCE SCHOOL IN THE WORLD. 256 COURSES. PERSONALIZED INSTRUCTION, CAREER GUIDANCE, EASY-PAY PLAN. DIPLOMA TO GRADUATES.
SIX MONTHS LATER.. I.C.S. SENT MY BOSS REGULAR REPORTS OF MY PROGRESS. THEN ONE MORNING...
BURT, I'VE JUST MADE YOU THE ASSISTANT MANAGER OF YOUR DIVISION...AT $15 MORE A WEEK. AND THE WAY YOU'RE GOING NOW, THIS IS JUST THE BEGINNING.
GOSH! THANKS MR. TAYLOR!
I GOT IT, HONEY! I GOT THE PROMOTION! OUR MONEY WORRIES ARE OVER! TODAY'S OUR LUCKY DAY!
TODAY AND THE DAY YOU MAILED THAT I.C.S. COUPON!
WHY NOT MAKE THIS YOUR LUCKY DAY? LET I.C.S. PUT YOU ON THE ROAD TO MORE PAY, RAPID ADVANCEMENT, REAL JOB SECURITY. HERE'S THE FAMOUS COUPON. MAIL IT NOW!



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SPECIAL FEATURES

These Karts Go, Go, Go! ..... ***Griffith Borgeson*** **63**
Will The "Mercy Mist" End Wars? ..... ***Arthur Kranish*** **76**
I Rode A Navy Blimp ..... ***Harvey Gardner*** **78**
Faster Than The Wind ..... ***Laurence M. Whyte*** **96**
Car Doctors Wanted ..... ***Stanley Brams*** **100**

TOM McCAHILL

Mail For McCahill **53**
Drives A Kart **70**
Tests The '60 Plymouth **86**

REGULAR FEATURES

Inventions Wanted! **73**
Hunting And Fishing: Fishing Through The Ice ..... ***Wynn Davis*** **74**
Now See This! **75, 89**
MMI: Totem Pole Tycoons ..... ***Rudy Arnold*** **84**
MIMI **85**
It's New! **93**
Bright Idea: Kik-Step **98**

SHORT FEATURES

Skeeter-Size Scooter **81**
How They'll Time The Winter Olympics **82**
Plastic Solarium **90**
Yesterday's Car Of Tomorrow **92**
New French Autogiro **99**

DEPARTMENTS

Dear Editor **18**

HOME-CRAFTS-SHOP CONTENTS ON PAGE 10

JANUARY, 1960

VOLUME 58, NUMBER 1

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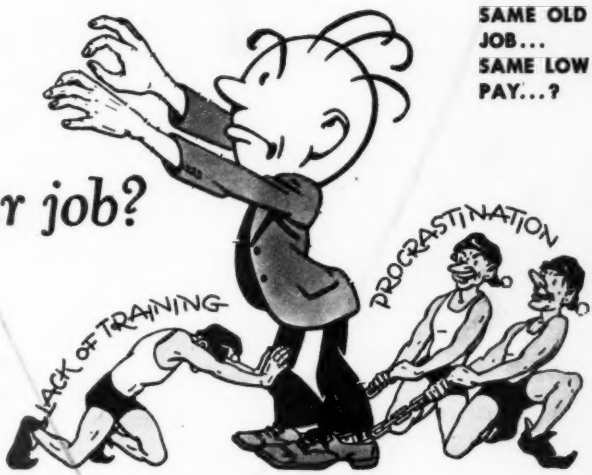
Are You "STANDING STILL" *on your job?*



You can justify a real pay raise and a better position—by making one simple move—the move that opens the way to more earnings and promotions—*practical training*.

If YOU are "standing still" on your job—no promotions—only token increases in pay—then you had better do something about it. You know that if you are untrained, your chances of getting ahead are slim. NOW IS THE TIME TO PREPARE.

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NEW ELECTRONIC INVENTION FROM UNITED STATES RADAR RESEARCH!

Turns House Wiring Into 500-Foot TV Antenna

- Sets up in 1 minute—No Tools or skill needed
- Increases TV Receiving Area Over 100 Times!
- Simply plug in socket—Uses no current!
- Adds new life & sparkle even to weakest channels
- This new type antenna now used in ½ million homes
- Recommended by Radio and TV dealers everywhere

Radarex-Tenna
Sold Only by
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Have you been getting wishy-washy TV pictures lately—the blurry, faded out kind with no contrast . . . no detail? Have you been annoyed with "snow" and "ghosts" . . . streaks and wavy lines? Worst of all, has your set failed you right in the middle of your favorite show—just when you'd invited the neighbors? If this happens to you, don't curse the manufacturer . . . don't blame the condensers or picture tube—these may be fine yet you get pitifully poor reception. Why waste money on service calls, paying up to $95.00 to replace your picture tube—when chances are the real trouble maker is your antenna. Yes! Millions of homeowners get weak, grayish pictures, annoying flickers and even blackouts —simply because they rely on a 20 foot roof antenna or those 3 foot indoor "rabbit ears" to pull in good TV pictures from miles and miles away . . . thru concrete and steel . . . thru fog and smog! Is it any wonder that you get muddy, eye-straining pictures? Under these conditions, even the latest, most expensive TV set will fail to give you satisfaction, because no TV set is any better than its antenna!

New Electronic Miracle Changes Your House Wiring into a 500 Foot TV Antenna

In your apartment or house, right now, you have a huge, built-in aerial hundreds of feet long—*much longer than the famous TV antenna atop the Empire State Building*—yes, your house wiring can be made into a giant TV antenna in less than a minute. Now you can harness all this tremendous reception power by using an amazing new invention—*the RADAREX-TENNA*. Based on the principle of RADAR—this new discovery acts just like Radar—pulls in TV waves from every direction, north, south, east and west, with as much as 500 feet or more of wire, instead of the 3 to 20 feet in older type home aerials. *Imagine it . . . the reception area is multiplied a hundred times or more!* Result: You get movie sharp pictures even on weak channels. Gone is the fluttering . . . the annoying "snow" and ghostly grays. You enjoy new depth, new vivid contrasts, new brilliancy—and stronger, clearer sound too! Even sets 5, 6, or 7 years old will give you unbelievable new reception. All this can be yours in less than one minute after you receive your RADAREX-TENNA. *Now you may use it 10 days FREE—try it, enjoy it, see with your own eyes what a wonderful difference it makes—without risking one penny, without obligation.*

Plugs In Like An Electric Cord Yet Uses NO Electric Current!

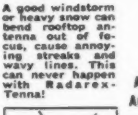
Simply hook the RADAREX to your set, plug into any outlet and in less than a minute you've given your TV new life, new unbelievable performance. Costs nothing to operate because it uses no current. Has no moving parts. *Never wears out.* Never overheats. *Never needs adjustment.* Plug it in and forget it. Safe! Positive acting! Invisible! You can throw out the "rabbit ears"—you can pull down that unsightly roof antenna. Once you try this new invention you'll never want to use older type aerials again!

Dealers selling popular radios and TV's like RCA, General Electric, Zenith, Philco, Westinghouse, etc. recommend it to their new TV buyers because it means greater customer satisfaction, less complaints and service calls.

Don't Spend Another Dollar for Needless Service Calls

Are you irritated over paying $3 to $5 for the same old TV repairs? Don't blame your service man if he can do little or nothing for you—very often the trouble is not INSIDE your set, but OUTSIDE! Yes. The real culprit can be your old, small and weak TV antenna! Simply install the new powerful RADAREX-TENNA and those weak reception troubles vanish in less than one minute! No more frustrations! No more useless service calls! You can save from $25.00 to $100 a year.

A good windstorm or heavy snow can bend rooftop antenna out of focus, cause annoying streaks and wavy lines. This can never happen with Radarex-Tenna!



Now—banish ugly, unsightly, often ineffective "rabbit-ear" antennas forever!

A TV Antenna Longer than the Master Antenna Atop the Empire State Building!

Believe it or not—hidden in the walls of your house you have an invisible, built-in antenna that is longer than the world-famous antenna atop the Empire State Building. Leading radio and TV stations use this antenna to broadcast to over 10,000,000 listeners. It costs them thousands upon thousands of dollars in special rental and maintenance expense. But you can use the invisible antenna in YOUR OWN HOUSE OR APARTMENT absolutely FREE—by using the latest marvel of electronic science—the RADAREX.

No wonder the *RADAREX-TENNA* is the *BIGGEST* selling antenna of its kind in America, Canada, Hawaii, Alaska! Far superior to "look-alike" antennas that cost almost as much or more. But don't be fooled. The RADAREX-TENNA sold *ONLY BY MOTO-MATIC CO. DIRECT TO YOU!* As advertised in New York Times, New York Herald Tribune, in the Hearst Newspapers, Scripps-Howard Newspapers and scores of other papers, magazines throughout the world!

10 DAY FREE TRIAL

SEEING IS BELIEVING: We KNOW what the amazing RADAREX has done on scores of TV's and radios, under all sorts of conditions, in high interference areas, in far-away country homes, in steel and concrete buildings, in fair weather and foul. That's why we dare say: *TAKE A RADAREX—WITHOUT RISK OR OBLIGATION! Try it free 10 full days. Enjoy it on your favorite TV programs. Let your own EYES and EARS be the judge. You must see and hear the big difference. You must get movie-like pictures on ALL local channels . . . not just on one or two—but ALL of them . . . you must be able to say goodbye . to bothersome streaks and "ghosts" . . . those wavy lines and bleary reception due to weak reception area.* You must be thrilled at the new performance, the crisper, clearer pictures, the better stronger sound—yes, you must be satisfied in every way or every cent of your money comes right back to you.

Banish Low Reception Troubles

How often are you bothered by "ghosts," streaks, lines, distortions, "snow," static? Isn't it the most annoying and sometimes embarrassing thing. Now you CAN do something about it. Remember, the causes of many TV interferences DON'T come from inside the set—but from some OUTSIDE your set. Yes, it's common knowledge that your antenna not only picks up the picture you see on the screen, but also picks up electrical static waves that can actually ruin your TV viewing picture. A doctor's X-ray or diathermy machine a mile away from your house can send zigzagging lines skimming across the middle of your screen. A jet zooming overhead can make your TV picture flutter. A passing trailer, truck or car can distort the TV picture. One of the best ways to block out these TV interferences is with a super-powerful antenna like the RADAREX-Tenna which increases your TV viewing area HUNDREDS OF TIMES! It picks up high frequency and ultra-high frequency sound waves sent out by TV stations —pulls them in stronger, better, clearer. Local interference signals are diluted. Your Radarex helps BLOCK THEM OUT COMPLETELY!

SPECIAL DUOTRONIC PLUS MODEL—ONLY $1.00 MORE!

Has triple checked built-in CAPACITOR that acts as a condenser and filter for many annoying interferences from appliances, planes, cars, etc. Also has 30% greater lead-in than regular model. Piano-Box shape permits placement of TV set closer to wall.

No. 10 Regular Model ..$3.98

No. 11 DUOTRONIC PLUS Model $4.98

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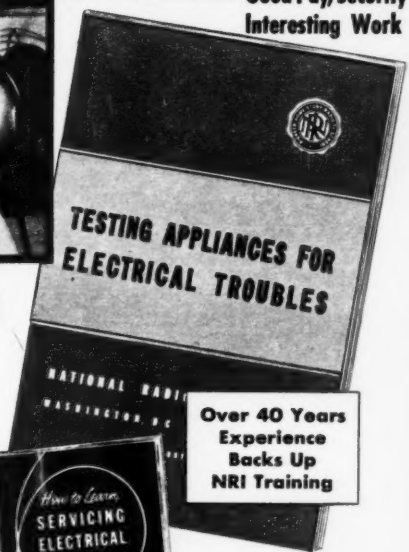

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Earn more money. Enjoy doing important, interesting work. Learn Electrical Appliance Servicing. This is a field of increasing opportunity. Today every wired home has many electrical appliances and millions and millions of new appliances are made and sold each year. Find out more about this great, growing field. Find out how NRI can train you, at home and in spare time to be an Appliance Service Technician. See how you can start soon to make extra money servicing appliances.

Over 40 Years Experience Backs Up NRI Training

Add to Your Income Soon After Enrollment Opportunities Increasing for Service Technicians

NRI Training is practical, thorough. You get easy-to-understand lessons, *and* NRI supplies parts to build professional type Multi-Use Tester. Use it to get practical experience. Soon, you can add to your income by servicing appliances. Build a profitable *sideline* for your spare time—qualify for a good job—develop a business and be your own boss. As an Appliance Service Technician, your opportunities are broad—your services wanted, gladly paid for, highly regarded in your community.

Appliances are necessary to comfortable, convenient living. Owners pay well to keep them in repair. The field is amazingly big. In addition to major appliances such as electric ranges, air conditioners, refrigerators, there are over 40,000,000 electric irons, 5,000,000 electric blankets, 15,000,000 coffee makers, plus more millions of vacuum cleaners, fans, toasters, mixers, etc.

Find Out What Appliance Repair Offers You

Learn and Earn With Tester Diploma When You Finish

Locate appliance troubles easily with Portable Appliance Tester you build. You use it to learn and do actual electric appliance repair jobs. For only $3.00 with enrollment and $6 per month, get training including Tester—a small price to pay for increased earnings. Mail coupon for Sample Lesson and Book—your first step toward more interesting work, bigger earnings. **NATIONAL RADIO INSTITUTE, Dept. CA0, Washington 16, D. C.**

Mail Coupon FOR LESSON AND BOOK **FREE**

National Radio Institute
Dept. CA0, Washington 16, D. C.

Please send me Electric Appliance Servicing Lesson and Book FREE. (I understand no salesman will call.)

Name_____ Age_____

Address_____

City_____ Zone_____ State_____

ACCREDITED MEMBER NATIONAL HOME STUDY COUNCIL

MILLIONS IN MAIL ORDER

An open letter to anyone who wants to make MORE MONEY with LESS EFFORT!

Dear Friend:
If you're like most people, you have always dreamed of "some day" starting and owning a nice little Home Mail Order business, so you can quit knocking yourself out day after day, with no real money to show for it.
"What a relief," you have thought. "Just to pick up orders and money at the Post Office, with almost nothing else to do but spend your profits." No traveling. No hard selling. No night work. And you want to know something? That's **exactly** the way a Mail Order Business can be, under the right circumstances. I am doing it myself. I've helped other ambitious men and women to do it. And I'll help you, if you'll let me.

Start Now — No Experience Required

I'm not talking about a long winded book on "Mail Order Methods," or a "Course of Study" that will take you a year to digest and still leave you up in the air! You've answered ads like that. I am sure . . . only to be disappointed and perhaps even annoyed that they **promised so much**, and turned out to be of such little **practical** value. No . . . I'm not trying to educate you. My purpose is to **set you up in a profitable Mail Order Business** . . . not next year or next month, but **right now** so you can start making money the **same way I do.** A way that has brought me security and financial independence.

The Secret Key That Has Made Millions

The heading on this ad mentions what I call the "Secret Key," and says it has "Made Millions in Mail Order." And that's no exaggeration! It is responsible for some of the most **fabulous successes in history!** There's not room here to explain it . . . but if you show a **sincere interest** by mailing me the Coupon below, I'll send you a **FREE sample** and tell you how to use it . . . to make more money with **less effort** than you have ever imagined, even in your wildest dreams! That's Step No. 1 of my plan to set you up in business.

Cash In On Foreign Made Products (Imports)

Everybody knows that there is a **fantastic profit** in IMPORTS . . . that items costing 50c or $1 abroad often sell up to $5 and $10 in this Country. But what most people **don't realize** is that importing procedures are **too complicated** for the average person to undertake on his own. **And that's where I come in.**
I am already importing watches, and ceramics, and sporting goods, and hundreds of other fast-moving items from all over the world. . . . Now you can do the same **without** experience or previous Importing knowledge!

No Investment In Merchandise, No Face To Face Selling!

My secret Key Plan is an airtight Program, all laid out for you ready to go. I make everything available to you at once! You do not advertise; you do not prepare advertising literature of any kind. You do not invest in merchandise or inventory. You do not **even handle** the Imports that you sell so easily, by mail, to the public. About all you **have** to do is go to the Post Office for your mail, then to the Bank with your profits! That's Step No. 2 of the Program I offer you.

Exclusive Franchise If You Act Now And Can Qualify

Once you **start** making money in this exciting way, you'll want to make sure it will last . . . so my 3rd and **final** step is to offer you an opportunity to have an **Exclusive Franchise** to hold as long as you qualify. With this Franchise as protection you may make **more**, and **more** and **MORE**. Start as small as you wish at home, build a big business requiring a special building and dozens of employees, if that is your ambition.
My own beginning was made with about $50 capital, and no help from anyone (such as I now offer you). Today my sales by mail have long since passed the **million dollar mark.** I own a big home and my own business building, drive to work in a Cadillac, pay out thousands of dollars a month to employees. And every penny of this came from **mail order profits.**

Airmail the Coupon today sure.

Only a limited number of Exclusive Franchises are available. I'll see that you get the FREE sample of the "Secret Key" along with complete details of my **Entire Secret Key Plan** immediately. No cost or obligation. Just fill out and mail the Coupon NOW! You will always be glad you did!

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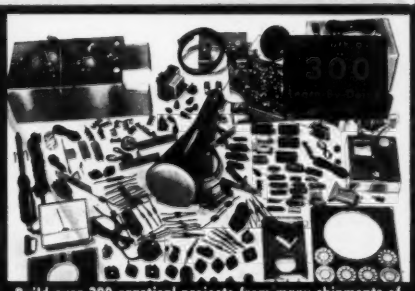

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That's what Stanley Hyman has made selling the amazing new PRESTO Fire Extinguisher!

STANLEY HYMAN

All over the United States, more and more men and women report large profits from introducing the new Presto Fire Extinguisher. And no wonder! 11,000 people died in fires last year! Over half were women and children! Civilian defense authorities have said that in the event of atomic attack regular fire-fighting forces will be fighting large fires and that the people must be equipped to take care instantly of the little fire that might so easily become a big one. So an eager public has been waiting for a handy new kind of fire extinguisher—one *without the drawbacks* of large, bulky, expensive models. Now it's here.

Over 3 Million Prestos Already Sold!

Presto salesman H. J. Kerr reported making $20 a day. William F. Wydallis—$15.20 an hour. Peter Zuccaro, a beginner—$169 in one week. And this report from Stanley Hyman:

"I have been selling the Presto Fire Extinguisher for well over a year and have found it to be the fastest money-maker and quickest-selling item ever produced. If a man demonstrates it intelligently, sales follow automatically.

"I have made an excellent living with the Presto Fire Extinguisher, having made over $1,000 a month. Presto is a 'natural.' "

How You Can Make Good Money Too

You can make good money in this way too! Just start introducing this new kind of fire extinguisher to civil defense workers, owners of homes, farms, cars, boats, filling stations, buses, trucks, factories, offices, in your locality and to stores for re-sale.

The Presto is so light—so small—so handy—even a child can put out a blaze with it. So inexpensive ($4.95) anyone can afford it. Yet its contents (a new wonder chemical developed during the war) have been rated 1.5 to 6 times as effective as other extinguishing agents on an equal weight basis!

- Ends fire fast as 2 seconds
- Contents 1.5 to 6 times more effective on an equal-weight basis
- Weighs less than 1 lb.
- Fits in palm of hand
- Never corrodes or deteriorates
- Costs only $4.95
- Guaranteed for 20 years

Nationally Advertised

And what sales advantages for you—as compared with large, bulky extinguishers that cost 4 times as much and are 8 times as heavy! Presto is easier to use. No pumping—no heavy tank or tangled tubes to struggle with. Just a twist of the knob . . . and flames disappear as fast as 2 seconds!

Mail Coupon to Get Started

We give you FREE printed sales aids. You are not required to invest a penny.

Get started now. Every day you hesitate may cost you $10, $15, or even $50 you could otherwise be making. Mail coupon NOW for everything you need.

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MI HOME CRAFTS SHOP

continued from page 2

SPECIAL FEATURES

Build MI's Kart 102
Get Better TV & FM Reception 107
How Not To Use A Ladder 118

HOME AND SHOP

Ice Skate 'Round The Yard 110
Extra Garage Door 114
Shop Tips 117
Built-In Bar 124
Telephone Book Cabinet 128

BOATING

Marker Buoy 123

PAINTING

Fresh Paint Tips 127

AUTOMOTIVE

Detroit: How To Install An Ammeter 132
Emergency Repairs 134
Service Tips 137

PHOTOGRAPHY

Monthly Photo Contest 142
Portraits With A Three-Dollar Lens 144

ASTRONOMY

The Amateur Telescope Maker's Page 149

DEPARTMENTS

Shop Shorts 112
MI's Hardware Store 130
Golden Hammer Award Winners 146

Your big opportunity to walk into Something Good!

Wouldn't you be happier with a job that not only is secure and highly paid, but also offers a splendid opportunity to go in business? The fast-growing refrigeration and air conditioning industry meets this requirement. It can use 20,000 newly-trained mechanics every year. *It needs you.* Refrigeration is so widely used in the home, in industry, and in transportation, that opportunities exist almost everywhere. You may become established right in your own community. For complete information on how to get into this lucrative field, fill out and mail coupon.

Enjoy the prestige of a service engineer

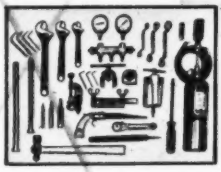
Few colleges offer courses in air conditioning. Therefore, industry chooses its service engineers from the ranks of well-trained technicians. What a wonderful way to gain *professional* status—and greater income—without benefit of a college degree!

CTI has the *practical* way to train you for success in Refrigeration — Air Conditioning

As in anything else, there are short-cuts to getting ahead. In the refrigeration field, the short-cut is CTI Home Training. There is no other training like it. Only CTI home study is *practical*. Only CTI sends all parts and tools to build the condensing unit illustrated at right. You run many experiments—go through the trouble-shooting and repair techniques you'll encounter on the job.

How CTI students earn money as they train

Many students, after a few lessons, earn extra cash by installing and fixing refrigeration and air conditioning units. Some work evenings and weekends for local dealers; others establish service routes which include restaurants, motels, meat markets, supermarkets, etc. This is possible because CTI training is *practical*—equips the student to do field work. CTI training can pay its way—start you in business while you're still a student! Others have done it. You can too!



You gain experience as you train, because you learn by practicing. You get mechanic's tools and special equipment (left), as well as all parts to assemble a heavy-duty, commercial-type, ¼ h.p. condensing unit (above). Then you can build a refrigerator, air conditioner, freezer or milk cooler.

PROOF! Read these letters from CTI men

"I'm in the refrigeration business for myself now. I earn nearly double what I used to. During my training, I made enough to pay my tuition."—*Alfred Helm, Ky.*... "I've started a business and it's a success." —*Otto Degner, Canada*... "I am in business for myself. I am building a nice trade doing service work."—*Paulie Waters, Tex.* ... "I applied for a job to install air conditioners in autos and got it."—*Richard Vinet, La.*... "Your refrigeration training helped me get repair jobs after only twelve of your lessons."—*Frank Green, W. Va.*

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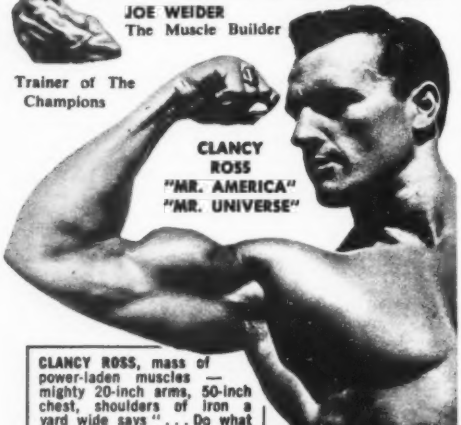

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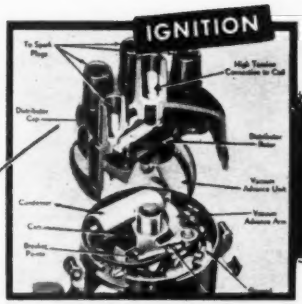

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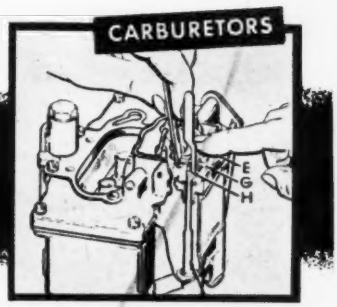

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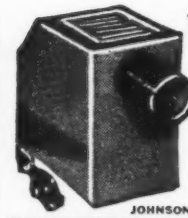

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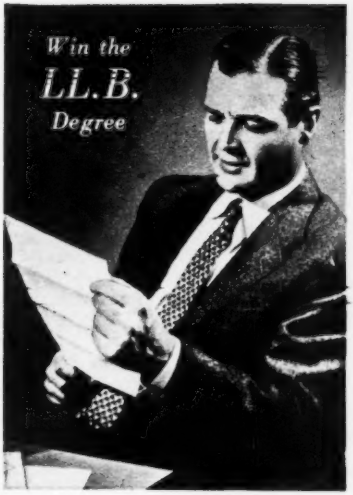
ANSWER: No. Crane's counter-offer was a rejection of Doe's offer.



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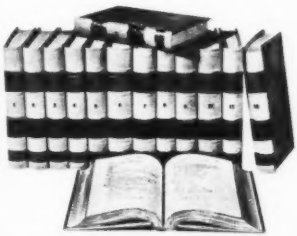

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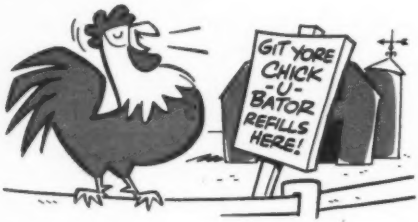
• *Chick-U-Bator*



Please advise me where I may purchase Chick-U-Bator as featured in MECHANIX ILLUSTRATED in October.

John Boehmke
Miami, Fla.

This handy little one-egg incubator is a product of the Fleet Manufacturing Co., Box 649, Glendale, Calif. Refills can be obtained at any poultry yard where a rooster is in residence, we are told.

• *Old MI Articles*

For the benefit of those who may be interested, the New York Public Library has in its files every issue of MI from late in 1937 to date. Your readers who live in New York may find it convenient to visit the Library to read the issue in which they are interested. For those who find it difficult to get to New York, the Library maintains a photographic service which makes photostatic copies and microfilms of Library materials. The prices are reasonable for the photo duplication service. Readers may write to the New York Public Library, Photographic Service, Fifth Avenue at 42nd Street, New York 36, N. Y.

Kenneth N. Karpel
Beechhurst, N. Y.

• *Ask Us Anything*

I am writing you the following as I understand you answer some unusual problems sometimes. I make up souvenirs and the like to sell and I have an order for an item which is made up of imbedded plastic, and the article they want imbedded in the plastic is cootie bugs. My problem is where to get the bugs to place in the plastic. I thought perhaps you would know of someone, as you deal with people who have unusual occupations, or perhaps could give me information where they could be obtained.

Johnny Kucera
Salem, Ore.

We phoned New York Scientific Supply Co., 28 West 30th St., New York 1, N. Y., and a Mr. Rubinger there said yes, they can get them for you. We asked where they got them and Mr. R. would only say "We have collectors." Lots of luck, sir—you really have a lousy little order there. In some circles it should prove quite a conversation piece.

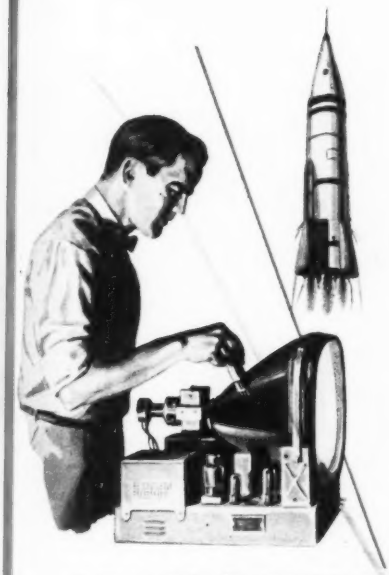
• *The Price Was Right*

In Skin Diving For Jade (Sept. MI) it is stated that jade sells for $2-$5 a pound. Another magazine states that jade sells for $200-$500. What's the scoop?

Edmund F. Rayburn, Jr.
Grover City, Calif.

Jade fetches from 50 cents a pound up to $1,000 a pound, depending on quality, we are told by Mr. Arnold Pritcher of the International Gem Co., New York. Top grade jade comes from the orient. Our price was right for the jade described in the article.

[Continued on page 27]



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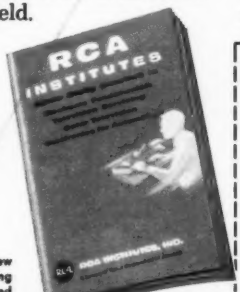

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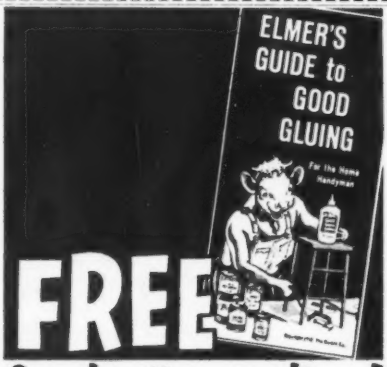

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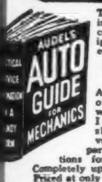

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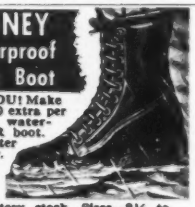

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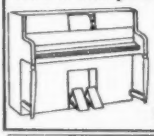

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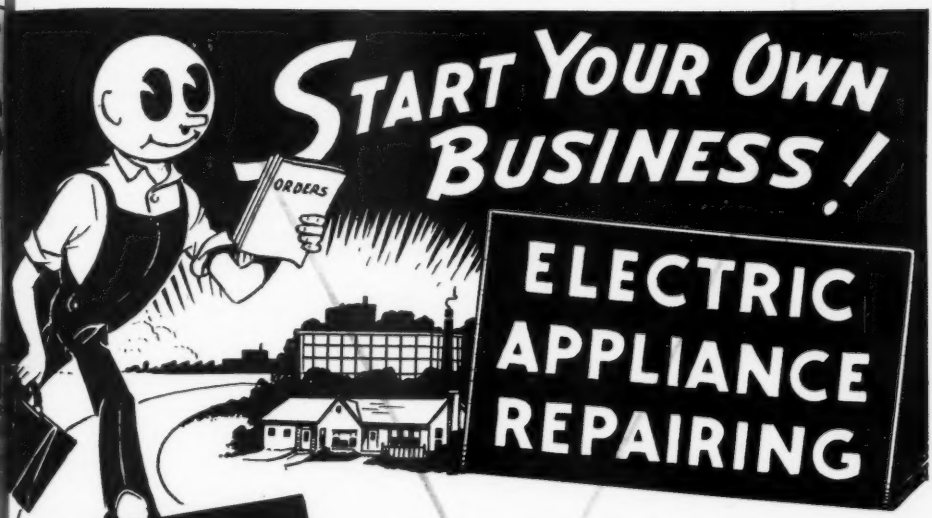

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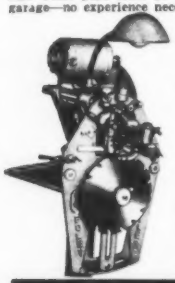

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All for 20c a Day!

PREPARE for a fascinating, profitable Art career this easy proven way. We supply TWO 22-pc. ART OUTFITS *at no extra cost.* Our low-cost "teach-yourself" course includes all branches of art listed here. Cash in on demand for trained artists in advertising agencies, newspapers, magazines, TV stations, etc. Make good money part time or full time; free lance or be your own boss. **FREE BOOK** describes our easy method. Send for it. No obligation. No salesman will call. Clip ad, fill in name, address and mail to: **Washington School of Art, Studio 101, Port Washington, N. Y.** *(Est. 1914)*

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$1 BRINGS YOU $18

Discover Flok-Kraft and Earn $$$$$ AT HOME

Earn up to $15.00 per hour spare time. Amazing new Velvet-fiber spray instantly makes any object (Lamps, Radio & TV Cabinets, Figurines, Signs, Auto dash boards, toys, furniture, draperies—anything) worth expensive $$$$$ Prices . . . like magic, you can spray anything with this beautiful new suede-like finish that feels like rich Velvet.

EARN UP TO $300.00 PER WEEK SPARE TIME

Imagine, materials cost only 3c per square foot. (Average TV or radio cabinet can be beautifully sprayed with this startling new 3-dimensional Velvet finish in 15 minutes at a cost of only 34c in materials. Your charge for this job is at least $10.00.)

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Own your own business. Work at home in your spare time. Help fill the huge growing demand for this amazing new beautiful Velvet-fiber finish. Orders come from stores, offices, homes, architects, auto dealers.—everywhere. Possible $20,000,000.00 worth of jobs to be done. Investigate today—be first in your area!

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Learn Radio-TV Electronics

by Practicing at Home in Spare Time

Without Extra Charge You Get special NRI kits developed to give actual experience with Radio-TV equipment. You build, test, experiment with receiver or broadcasting circuits. Keep all equipment.

Have High Pay, Prestige, Good Future as a Skilled Radio-TV Electronic Technician

People *look up to* and depend on the Technician, more than ever before. His opportunities are great and are increasing. Become a Radio-TV Electronic Technician. At home, and in your spare time, *you* can learn to do this interesting, satisfying work—qualify for important pay.

A steady stream of new Electronic products is increasing the job and promotion opportunities for Radio-Television Electronic Technicians. Right now, a solid, proven field of opportunity for good pay is servicing the tens of millions of Television and Radio sets now in use. The hundreds of Radio and TV Stations on the air offer interesting jobs for Operators and Technicians.

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NRI students find it easy and profitable to start fixing sets for friends a few months after enrolling, pick up $10, $15 and more a week extra spending money. Many who start in spare time soon build full time Radio-Television businesses.

Act Now—See What NRI Can Do for You

NRI has devoted 40 years to developing simplified practical training methods. You train at home, learn by doing.

NATIONAL RADIO INSTITUTE Wash.16, D.C.

NRI Has Trained Thousands for Successful Careers in Radio-TV

Studio Engr., Station KATV
"I am now Studio Engineer at Television Station KATV. Before enrolling, I was held back by limitation of a sixth grade education." BILLY SANCHEZ, Pine Bluff, Ark.

Has All the Work He Can Do
"I have repaired more than 2,000 TV and Radio sets a year. NRI training certainly proved to be a good foundation." H. R. GORDON, Milledgeville, Georgia.

Has Good Part Time Business
"Early in my training I started servicing sets. Now have completely equipped shop. NRI is the backbone of my progress." E. A. BREDA, Tacoma, Washington.

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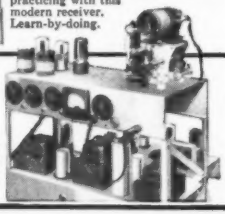
NRI Servicing Course includes all needed parts. By introducing defects you get actual servicing experience practicing with this modern receiver. Learn-by-doing.

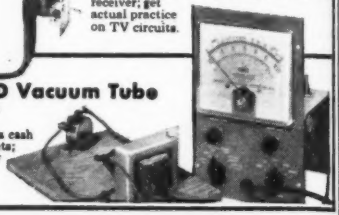


YOU BUILD Broadcasting Transmitter

As part of NRI Communications Course you build this low power Transmitter, learn commercial broadcasting operators' methods, procedures. Train for your FCC Commercial Operator's License.

YOU BUILD This 17 Inch Television Receiver

As part of your NRI course you can get all components, tubes, including 17" picture tube, to build this latest style Television receiver; get actual practice on TV circuits.



YOU BUILD Vacuum Tube Voltmeter

Use it to earn extra cash fixing neighbors' sets; bring to life theory you learn from NRI's easy-to-understand texts.

For Higher Pay, Better Jobs
Be a Radio-TV Electronic Technician

Servicing Needs More Trained Men

Portable TV, Hi-Fi, Transistors, Color TV are making new demands for trained Technicians. Good opportunities for spare time earnings or a business of your own. Enjoy prestige.

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4000 TV and Radio stations offer interesting positions. Govt. Radio, Police, Two-Way Communications are growing fields. Trained TV-Radio Operators have a bright future.

J. E. Smith, Founder

Train at Home the NRI Way Famous for Over 40 Years

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Dear Editor

[*Continued from page* 18]

● *Fast Deal In Clocks*

I have come by a number of assorted electric clocks from a surplus store here for real cheap. I found out, though, that all of them are of 50 cycles and will go fast on our 60-cycle circuits, gaining about ten minutes in an hour. Is there anything that can be done to their works to alter the cycle?

M.S.M.
Detroit, Mich.

You might equip the clocks with new gears to slow them down—but this would be troublesome and costly. The best thing would be to find a market for them as they are. Try some place where time goes fast.

● *Canoes And Kayaks*

Would you please send me information about building a two-man kayak and a canoe?

Ted Clarke
Washington Court House, Ohio

MECHANIX ILLUSTRATED *Plans Service, Fawcett Building, Greenwich, Conn., will sell plans for a kayak (Northwind) for $2 and plans for a canoe (Minnehaha) for $1. Make checks or money orders payable to Fawcett Publications, Inc. Orders from Canada and other foreign countries must be accompanied by international money orders payable in U. S. funds.*

● *Copper Plating*

Some time ago in MI you published an article about a man living in Florida who made a living by copper-plating sea shells and pine cones. Another man and I would like to add to our salaries by doing this type of work, but we don't know where to start or how to copper-plate nonconductors of electricity.

J.L.T.
Anaheim, Calif.

To copper-plate non-conductors you dust them with graphite first. Any of the copper-plating kits advertised in MI will put you in business.

● *Bird Traps*

I wonder if you folks ever published an article on making sparrow traps?

Geo. A. Smith
Tuscaloosa, Ala.

No, we never have. HAVAHART, Ossining, N. Y., makes such a trap.

World's Smallest Home "Machine Shop" Pays Big Cash Returns for Spare Time

NO HOUSE-TO-HOUSE. BIG LOCAL DEMAND FOR PRODUCT THAT'S EASY TO MAKE AND THAT SELLS FOR 5 TIMES THE COST OF THE RAW MATERIAL

This tiny "machine shop"—complete and ready to go to work for you—takes up only one square foot. Yet, small as it is, the machine puts you in business for yourself—right in your own home.

The metal products turned out by the machine are in big demand everywhere. Every man and woman in the country uses anywhere from five to twenty of them every day. The need for them is as great in the smallest town as it is in the biggest city. So no matter where you live, there is a huge market ready and waiting for you. Actually, forty million of these little necessities are bought every year—and rebought year after year.

Customers bring the jobs to you. Keep your regular job. Come home at night and turn out three or four profitable jobs while you're waiting for dinner to be put on the table.

Big as this business is today, it is the kind of business that never will be gobbled up by the giant corporations. It is strictly a *local* business. The product itself, by its very nature, must be made *locally*—in every community throughout the United States. Thus it is an ideal one-man business—or a business made-to-order for a man and wife team.

The machine that turns out this product is so simple and easy to operate that a school boy can be turning out professional work with only a few hours practice. Raw material that costs only 20c turns out finished products worth a dollar.

The demand is so great that you don't have to do any house-to-house selling in order to dispose of the kind of work your machine turns out. And you don't need any experience. We supply all the equipment you need and then show you nine different ways to keep the orders and cash coming in in a good steady clip.

I can't tell you the whole story in space this small. But if you will mail the coupon I will be glad to send full particulars by return mail—free and postage prepaid. Or just mail a government postcard if it's handier. You will not be under the slightest obligation and no salesman will call. Here is a wonderful opportunity to start making good money at home in your spare time.

Don't let such an opportunity slip through your fingers. Send coupon—or postcard—right away to me, Michael Roberts, 1512 Jarvis Ave., Dept. K-4-A, Chicago 26, Ill.

Michael Roberts
1512 Jarvis Ave., Dept. K-4-A, Chicago 26, Ill. **FREE!**

Dear Mr. Warner: Without cost or obligation, please send me the complete story about how I can get started in a big-profit home business in my spare time without any house-to-house selling. Everything you send me now is free and no salesman will call.

Name .....

Address .....

City ..... Zone .... State .....

FINANCIAL HELP TO START YOUR OWN HOME BUSINESS!

Tired of being squeezed between rising prices and a *stationary salary*? Could you use a nice little home-business to bring in *extra income* from your spare time, evenings and week-ends? I can show you *how*—will even *help finance you*, if you're short of cash. Sound unreasonable? Wondering how I can afford to do it? Well, it's simple. The business I'm talking about uses supplies. I *make* and *distribute* those supplies. So do other firms—but I'm willing to gamble that when your business gets rolling you'll rather do business with a *friend* than with strangers who did not show up until you were in the money. I've gambled the same way with hundreds of others, and it has paid off by helping me build the *biggest business of its kind in the world!* The Golden Rule of "do unto others . . ." *always works* for those who give it a fair trial.

What *is* this business? It's *printing without a press*, an amazing process I call *"Screen Print."* With it, you can turn out printing in *gorgeous coloring* that many big shops cannot duplicate, even with presses costing *thousands of dollars!* Yet my equipment *(supplied* to you with my instructions) *weighs only a few pounds*, can be set up on a *small table* in the corner of your garage, basement, attic, or even a bedroom. You can learn in a *few hours* to print on paper, metal, glass, plastic, leather, cloth, and about anything you can name – even on curved or round surfaces that ordinary printing presses cannot handle at all! And I show you how to get *big-profit orders* from stores, factories, theatres, schools, and practically every type of business or organization for miles around – even by *MAIL ORDER coast to coast*.

JUST SEND ME YOUR NAME & ADDRESS—NO MONEY

Remember, I'll help finance you, so *don't worry about the money* – whether you are employed or not. I'm *sure* I can help you get set in a home business that may settle your money problems forever. Just send name and address for FREE information, without obligation. *TODAY SURE.*

Mr. C. J. Nowak, President, Screen Print Co., Dept. 31, 15127 S. Broadway, Los Angeles 61, California

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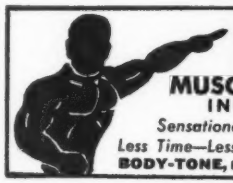

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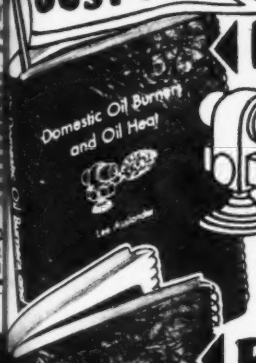

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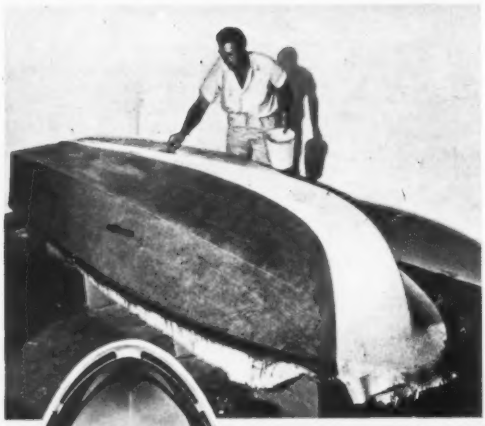

1. You assemble die-cut and printed pieces o rugated to make the SOCK Jig, build mah topsides and install mahogany seats.
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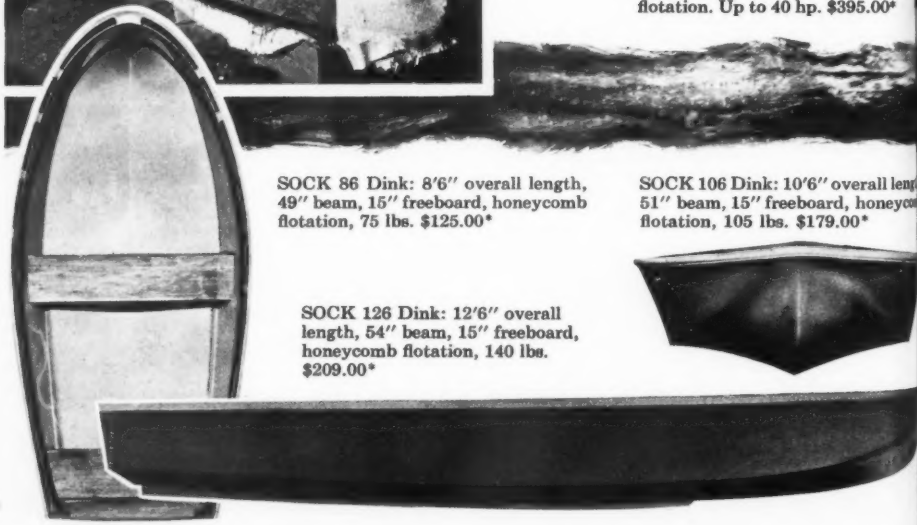

SOCK 86 Dink: 8′6″ overall length, 49″ beam, 15″ freeboard, honeycomb flotation, 75 lbs. $125.00*

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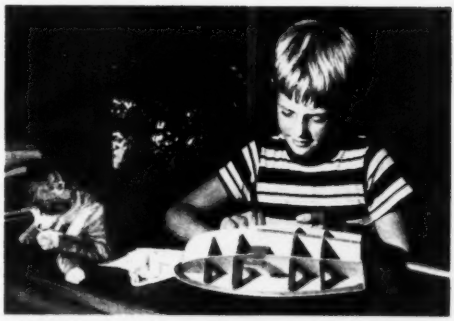

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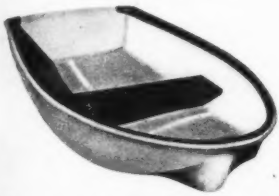

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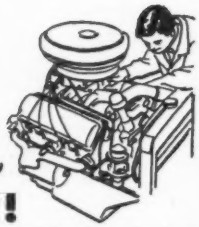

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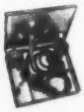

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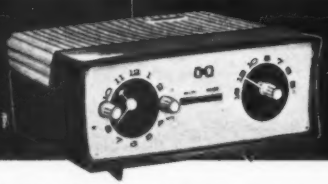

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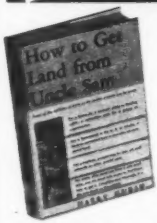

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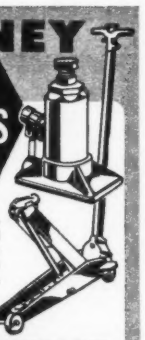

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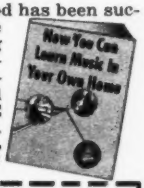

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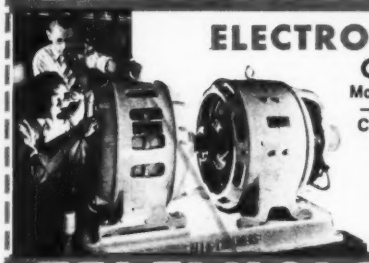

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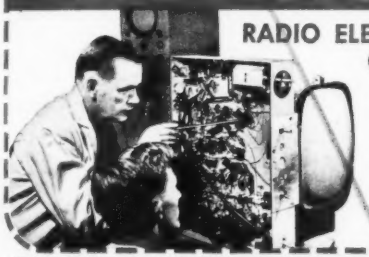

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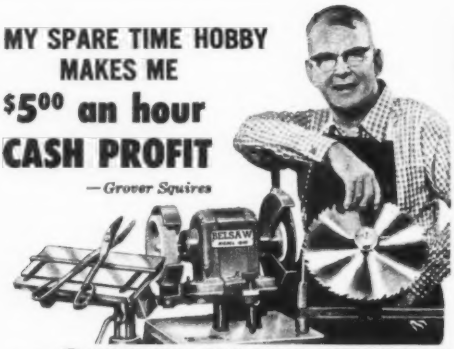

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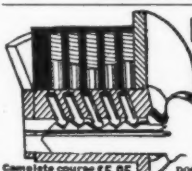

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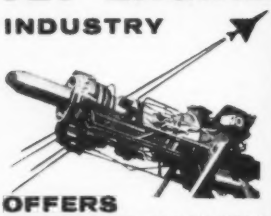

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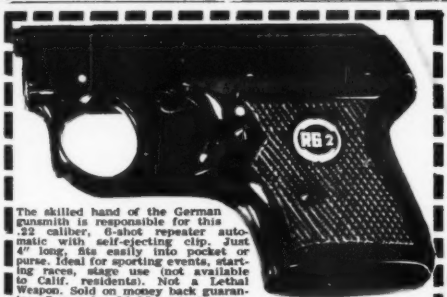

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UNCLE TOM ANSWERS HIS MOST INTERESTING LETTERS IN THIS COLUMN. WRITE TO HIM AT *MECHANIX ILLUSTRATED*, 67 WEST 44TH ST., NEW YORK 36, N. Y.

● *I read recently that some top sports cars are absolutely safe to drive on any road at 100 mph or better. Is this statement correct?*

Paul R. Craft
Albany, N. Y.

The guy who wrote that statement (and it could possibly have been me) probably meant that at 100 mph-plus in a good, well-suspended sports car you'd be a lot *safer* than in many sedans at 60 or 70 mph because of the superior brakes and maneuverability. However, one factor should be kept in mind: the faster you go, regardless of the rig you're driving, the more you reduce your area for maneuvering on the road. In other words, even on a perfect road two cars wide, the usable width is reduced to thread size at 125 mph. A safe cut to the right or left which you might make at 45 mph would somersault you for 1,000 feet at 125 mph. Even a fast whip out and in (a typical passing move at 60 mph) calls for all the dexterity of a brain surgeon at 115 or 120 mph. Although you can park a car between two others with ease at five mph, it becomes quite a feat at 50 mph. So remember—the faster you go, the narrower the road gets. At Daytona Beach the running surface is at times reduced to 40-50 feet in width due to tidal conditions. This seems like running right down a string at real high speeds, with absolutely no room to spare on either side.

● *I've been reading your stuff for over ten years and feel I know you pretty well, except I often wonder if you're a betting man. Please don't divulge my name if you should print this, as I've been a New York City bookie for over 30 years with a perfect record and have yet to feel the strong arm of the law. Anyhow, you look like a guy who used to place his action with me and was a nut on two- and three-nag parlays which he hit once in a while, to my chagrin. To settle a two-guinea wager between myself and a pal, do you or do you not play the horses?*

Name withheld as requested out of respect for law, order, decency and clean living.

The last time I bet on the horses was with Paul Whiteman. We had what we thought was the world's greatest tout—and he damn near was. At Monmouth one day, on a seven race card, we won the first six races in a row with the aid of the tout and then put the whole bundle on the seventh race—one that was so sure it was almost fixed. You know the answer; it's a good thing the tank in the car was almost full or we wouldn't have gotten home.

Incidentally, the wife of another pal of mine recently had the funniest horse-betting experience I ever heard of. This gal happens to be a top TV producer with two of the biggest shows on TV under her belt. Anyhow, she got to making $2.00 bets on horses and picked a real Rolls-Bentley type of bookie who rarely bothered with any bet less than a few hundred. She got the habit so bad she'd call him up a few minutes before every race and place a $2.00 bet with him. Naturally, this was tying up his valuable time at the wrong moment. So after a couple of weeks of this, Mr. Big (who only bothered to talk to her because of her position in television) said, "Look, Doll, *please* don't call me just before post time to place your $2.00 bet. Do me a favor—just *think* of a horse, any horse, and make a note of it. If he wins, I'll pay you. If he loses, you can pay me when you see me. I trust you."

● *Uncle Tom, you're a boatman—how about getting some action on the lousy weather reports that can actually kill you, and have undoubtedly killed some, if you pay attention to them? I left Brielle, N. J., one day recently on a charter boat and we got a weather report just before leaving the dock, saying, "Light northwest winds, six to seven miles per hour." So we took off with high*

[*Continued on next page*]

hopes for a real great day. Within two hours we were in a full northeast gale and were almost drowned coming back into the inlet at Manasquan. Aren't these jerks responsible to anyone for these reports that seem to be wrong more often than they're right?

George Sloan
Philadelphia, Pa.

Couldn't agree with you more, George. I've gotten in bad jams on several occasions, even in automobiles, by listening to U. S. Weather Bureau reports. Recently at Manasquan (it could have been the same day you're referring to) I got one of those "Variable light westerly wind" reports, though it was already blowing like blazes from the *east*. Unlike you, however, I drove to the Coast Guard station and asked. Their latest report said the wind was blowing from the *northwest*, which even had the Coast Guardsmen chuckling. I've been caught in some pretty bad storms in the ocean on days when the official prediction called for "fair and calm" and have run head-on into blizzards that had the roads blocked in a few hours when bluebird weather had been forecast. Someone ought to check up on these characters. I'll concede they can't always be right but their boxscore is pretty lousy. Some standards should be set for the Weather Bureau which they'd have to maintain or else move out and let somebody who can do a real job take over. For my dough, it's close to a national disgrace.

● *I understand it takes $425 deposit to get an Airline Travel Credit Card. Could this be because the airlines want to make sure they get paid in the event they drop you in the drink?*

S. Lasky
Chicago, Ill.

Well, we're waiting to hear another reason.

● *Can you tell me where I can get info on the construction of a practical steam engine?*

Steve Hansell
Swarthmore, Pa.

How about sending a note to the Baldwin Locomotive Works?

● *I just finished reading your book, The Modern Sports Car, and enjoyed it very much. I noticed you had a high regard for the Austin-Healey and a considerable liking for the MG. You did not mention much about the Triumph or Alfa-Romeo, which have become popular since the publishing date in 1954. How about bringing us up to date on*

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these as well as any other sports cars which you consider worthy of recommendation?

John Lozier
Portland, Ore.

Glad you wrote, John; gives me a chance to plug my *new* book, Today's Sports And Competition Cars (Prentice-Hall, Inc. $3.95), available at all good bookstores.

● *While looking through some back issues of MI I came across the January '54 issue in which I found an article entitled McCahill's Three-in-One Dream Car. It was very interesting. Here's a quote from it, "I'll have to close but, if I'm still at the same old stand, maybe we'll be back with the 1959 dream car five years from now. Wonder what it will be like?" Well, how about it? Have you thought up a new dream car yet, or have cars improved so much now that you couldn't?*

Rick Terry
London, Ontario

As you may recall, that '54 Dream Car became the '55 Thunderbird, more or less. Bill Burnett, who was Chief Engineer of Ford at the time, admitted this to me then and we quoted him to that effect in our '55 'Bird test. For instance, the Dream Car had interchangeable tops, hard and soft; this was first used by the 'Bird. There were also a number of other features that were similar but our Dream Car as it was designed would have been even better. As to a new Dream Car: If enough readers want it, we'll design one because the 1960 cars still have a long way to go before they can get the stamp of Half-Way Perfect. Here's a short list of what I think is wrong with our 1960 crop in general, in case anyone is getting the idea I think they're perfect.

Most cars being built today (excluding the new compact cars) have far too little inside room for their gigantic outside dimensions. In my opinion, we're not building a car in America with sufficient interior room for more than four passengers. Sure, you *can* cram in five, six or eight but it's uncomfortable and unsafe. Even with five passengers, unless they are all midgets, there will be discomfort on the seat where three are sitting.

Today's instruments, for the most part, are an insult to the buyer's intelligence. No longer do you have a simple trip meter. The idiot lights for telling you whether the oil is oiling or the Gen is genning are right off the drawing boards of Feeble-Minded Polytechnic. The glaring reflections from the top of the instrument panel on the already-distorted wraparound windshield are enough to gladden the heart of every eye doctor. The four headlights with beams too short on Low and too inadequate on High (which one top Detroit company engineer told me recently was just a

[*Continued on next page*]

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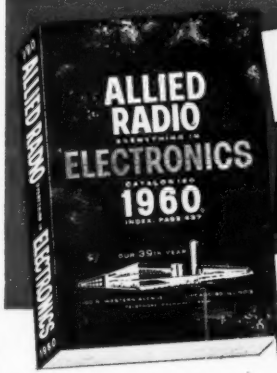

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bow to Styling) is functional engineering at its lowest ebb. The very best four headlight set-ups I've driven fall short of being safe even on turnpikes at any speeds much above 50 mph; at 70 mph they are outright dangerous.

All cars are still too heavy and getting heavier. Their gas consumption in some cases is ridiculous. I remember attending a luncheon a dozen or so years ago when a now-deceased engineer, whose hallowed name they're trying to make equal to Edison's and Pasteur's, made the statement, "Some day we'll have engines with ten-to-one compression ratio (they were about six-to-one then) and when we reach the ten-to-one goal, every car on the road will get better than 30 miles to a gallon of gas." Well, Buck, we've *got* ten and ten and a half-to-one compression ratios today but it takes a Volkswagen with six and a half-to-one compression ratio to give better than 30 miles to a gallon at normal speeds, with one or two other exceptions.

Engines should be a lot easier to service than they are. *All* cars should have reclining seats, like American Motors'. All cars should have side pockets in the doors, like the '59 Imperial. Suspension is still poor in most cars (with the exception of Chrysler) which brings up a point. Suspension on all American cars is superior to what it was eight or ten years ago. But remember that nearly all American cars are a lot more powerful and faster today. Therefore, by comparison the suspension is still lousy. The majority of American cars offers far too little driver comfort and very inadequate seats, certainly not to be compared with a good bucket seat, the safest and most comfortable for the motorman.

All our cars today come equipped with power brakes and power steering as options. Why don't they all have reserve tanks so that you'll still have power brakes and power steering when the engine cuts out? No, Virginia, the perfect car has not been built yet and they've still got a long way to go. If enough readers want a Dream Car for 1960 we'll whip one up. Just drop a card to Bill Parker, the head Yes-or-No man in this outfit.

● *I'd appreciate any help from you with regard to preparing my car for storage. I am leaving for Europe and the car will be in storage for three years. It is a '57 Pontiac Star Chief with leather upholstery, power steering and brakes. Any suggestions you may have would be appreciated.*

Sgt. Thomas B. Myers
Fort Benning, Ga.

We can't recommend storing a car of this class for three years, as your biggest loss

will be through depreciated value. However, if for some personal reason you wish to store it, jack all four wheels off the ground, remove the battery, pull the plugs, pour a couple of ounces of oil into each plug hole, then replace the plugs. Drain off all fuel. As there is a good chance your coolant hoses will be shot anyway at the end of three years, drain off the water and fill with kerosene. Then pull your valve spring keys to relieve the tension on the springs and cover the car with a tarp. If possible, store it in a well-ventilated building. As we said at the outset, we don't recommend this. You'd be better off selling the car now.

● *We just drove down to South Carolina and back. When we got home our cat had four kittens, three white and one brown. Our cat is gray. Have you got an explanation for that?*

Mrs. Clarence Nettles
Livonia, Mich.

Sure, but I'd rather you got it from the cat.
—*Tom McCahill*

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With our field-tested plan customers sell themselves. No cold canvassing. No hard selling. It's the nearest thing to 'Automation Selling.' Imagine a sales plan even a child can use successfully because the sales tools we give you (and which you leave with your prospects) do all your selling even while you sleep! No room here to give you all the details but if you want big money fast rush the coupon now.

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—Stanley

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ALVIN WESLEY, Sales Manager
Merlite Industries, Inc. (Alarm Division)
114 E. 32nd St., Dept. F-10H. New York 16. N. Y.

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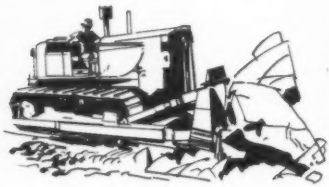

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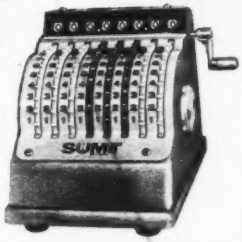

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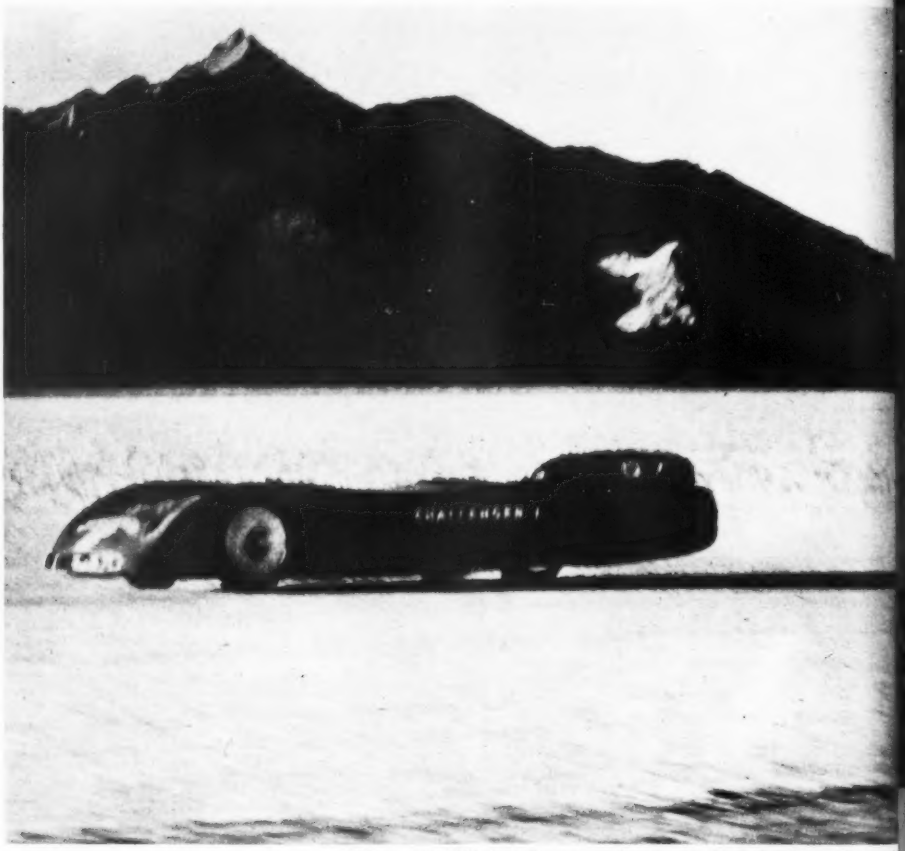


363 m.p.h.! Mickey Thompson breaks the U.S. land speed record! his Challenger I, *powered by 4 Champion-sparked Pontiac engines*

Q. Why does Mickey Thompson, holder of the U.S. speed record, use Champion spark plugs?

A. Men whose careers depend on *performance* and *power* know they can *rely* on Champions! Your car will get a boost in performance—and *save gasoline,* too—with new Champions. Put in a set every 10,000 miles!

CHAMPION

World's favorite spark plug—engineered for every car built by Ford Motor Company, General Motors, Chrysler, American Motors, Studebaker-Packard and every major foreign maker.

ACTION PHOTO taken at the first annual Championship Go Kart Races held at Azusa, Calif.

THESE KARTS GO, GO, GO!

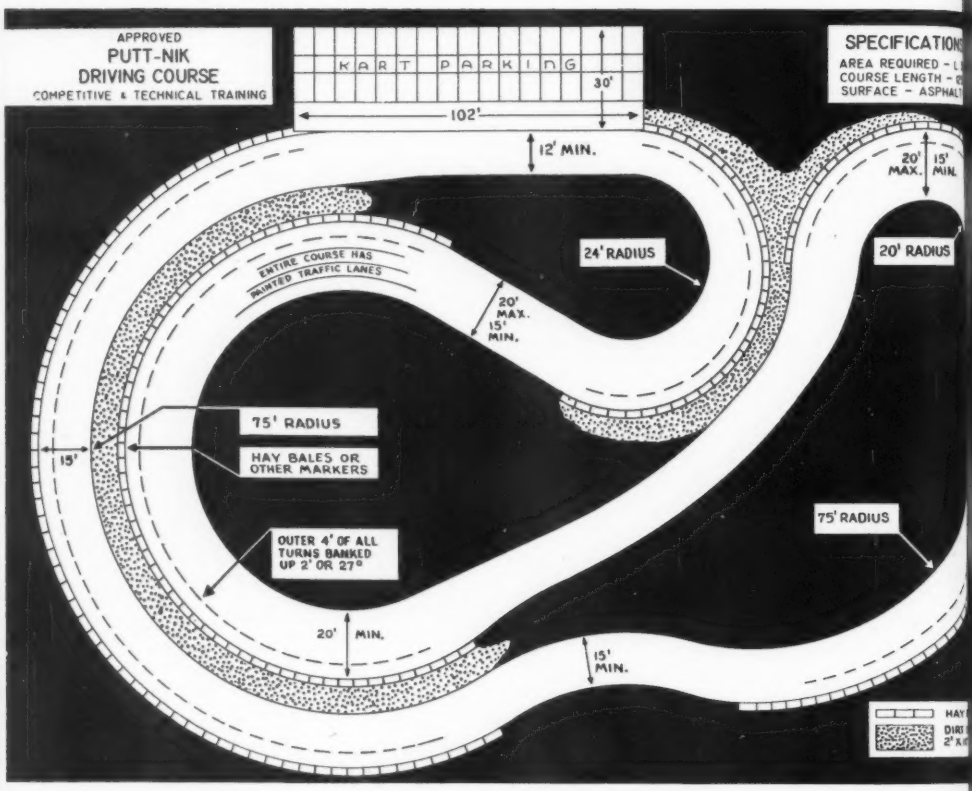
By Griffith Borgeson

TWO and a half years ago there was no such thing as a "go kart." Today there are at least 20,000 of the loud-rapping little bugs in use and manufacturers are selling all they can produce. Karting has become a big national sport and a big business.

For decades gadgeteering dads have built miniature cars for their kids. Karts are different: kids can drive them but, unlike quarter and micro-midget race cars, they were not designed for youngsters to drive while daddies watch.

Many an adult looking at a kart for the first time will say, "Me, get in that thing?" But adults, including six-foot-sixers, find that a kart fits the body as a shoe fits the foot. On the first lap around a parking lot a guy in a kart is probably having more sheer driving fun than he ever thought possible—and he couldn't care less if his knees are higher than his head.

The kart idea originated in the mind



THESE PLANS for a kart driving course are supplied by Putt-Nik Sales, Inc., in Atlanta, Ga. They estimate that grading and light paving for this course would cost about $2,500.

MODEL 400B from the Go Kart Mfg. Co., Azusa, Calif., uses a McCulloch 530 mill. This kart retails for $309, with paint job and upholstery as optional accessories.

of Indianapolis race car builder Art Ingels of Los Angeles. His concept was simple: to build the smallest possible automobile that would carry an adult of average size. It had to be fast enough to be exciting, cheap enough to be inviting, strong for safety and light for convenience and top performance. Everyone who rode Ingels' vest-pocket race car loved it but when he showed it to manufacturers they told him it would never sell.

Then Ingels met three hot rodders turned businessmen. They said the

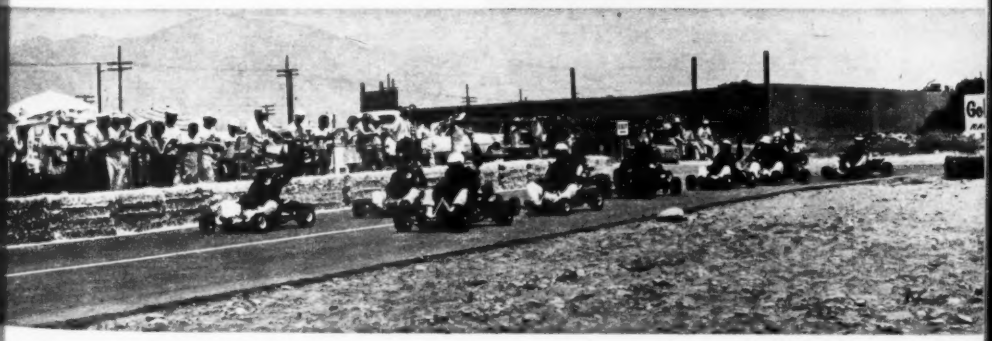
ADDRESSES OF KART MANUFACTURERS

You can obtain a list of kart manufacturers and their addresses by sending a self-addressed, stamped envelope to Information Dept., Mechanix Illustrated, 67 W. 44th St., New York 36, N. Y.

kart would have to be re-engineered to sell in do-it-yourself kit form. So they formed the Go Kart Mfg. Co. and devised the kit. They had hoped to sell enough karts to make a buck or two while playing with small-scale hot rodding. Business associates told them they were out of their minds and laughed at their folly.

Today Go Kart's three founders look back with stunned amazement on the industry—and the fortunes—they have created unexpectedly out of a little imagination and a world of luck. No less than 200 manufacturers are now turning out karts as fast as they can. But the competitors are making *karts*—not Go Karts. Go Kart is in the happy position of having invented and copyrighted a name which caught on immediately—something like owning the copyright to the word baseball—and is one of the leaders in a booming industry.

TWO-WHEEL driving is only for experts, like Duffy Livingstone. But karts are almost impossible to tip.

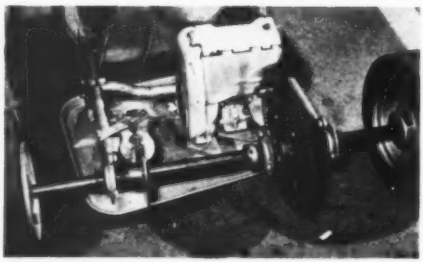


DURING RACE karts do one pace lap. Then the drivers raise their arms to let starter know they're ready for the green flag. Note the use of hay bales to protect the spectators.

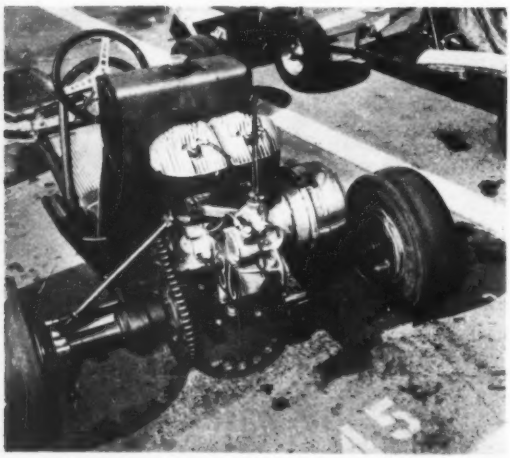
The typical kart weighs about 100 lbs., has a four-ft. wheelbase and is not longer than six ft. Being about 54 inches wide, it fits easily into most station wagons. It is powered by a single-cylinder engine of from 5.8 cubic inches and 2½ hp to 16.5 cubic inches and 24 hp. It has no body and no transmission;

CUSTOM KARTS show a lot of ingenuity in their power plants. This stormer uses three mills—Homelite chain saw engines.

CARETTA KART by Ingels-Borelli comes with a variety of engines and optionals. Prices of complete karts start at $225.



McCULLOCH chain saw engine is one of the most popular mills. It's shown here on a Hovey Hawk kart boasting live rear axle.



MANY OWNERS buy kart frames and install their own two-stroke motorcyle engines. This one mounts a two-cylinder Excelsior.

it uses a centrifugal automatic clutch.

Its controls consist of steering wheel (about ⅓ turn from lock to lock), an accelerator pedal and a brake pedal that operates simple but effective spot brakes which rub against the rear-wheel sprockets. The cheapest kart kit sells for $130 and takes about three hours of welding time to put together. Or you can buy a single-engined kart already assembled for as little as $140.

There's a lot you can do with the basic kart, once you have it. You can start out with an inexpensive engine, then go to a more powerful one. You can add a second engine to drive the other rear wheel. You can get fancy internal-expanding (and very effective) brakes, super-quality clutches, rack-and-pinion steering, fuel injection and custom-quality upholstery—these being just a few of the side industries that the kart craze has created.

And it has turned some long-existing industries upside down. For example, one of the world's best small two-stroke engines and one of the best for karts is made by West Bend, a company that had been chugging along nicely for years making chain saw motors. Suddenly, the sales curve began to sky-

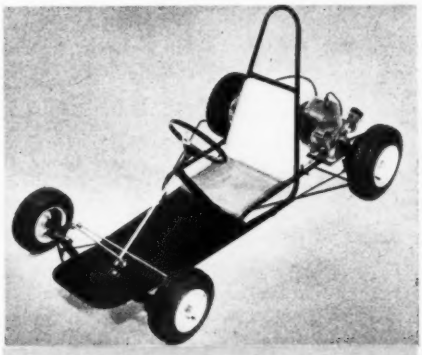
BUILD MI's KART

You'll find complete plans on how to build a 2½-hp, 30-mph kart in the Home-Crafts-Shop Section of this issue. Don't miss it!

HELLCAT KART, Percival Mfg. Co., was designed by famed racing car builder Frank Kurtis.

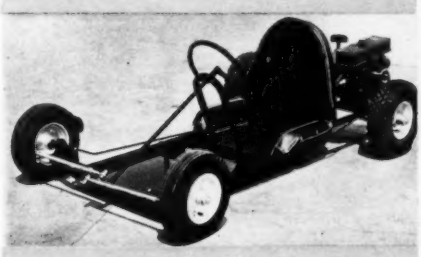
rocket for no apparent reason and the spare-parts inventory just about vanished. When the West Bend people started checking into the cause of this unheard-of demand, they found that the answer was karts. As the karting hobby continued to boom changes began taking place at the midwestern factory. Engines were redesigned to serve better as kart pushers and now the factory has built its own kart testing and proving ground!

As kart sales boomed, kart racing boomed, too. A group of enthusiasts formed the Go Kart Club of America to regulate kart competition in a safe, systematic and fair manner, to conduct



SWOOPSTER KART, model D510, has plenty of legroom, high rollbar and independent front suspension. $219.

BUG WASP comes in standard and custom versions, both with twin engines. Prices are $449 for standard, $499 for custom.



BATES KART is available with a great variety of engines and optionals, also comes in a kit. $129-$299.

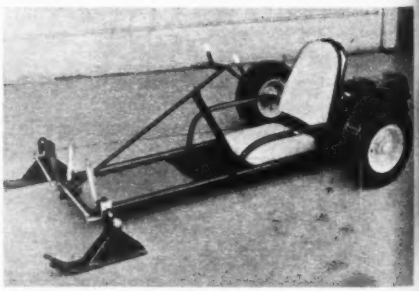
PIT AREA at the championship races shows some of 125 karts including ten factory teams.

racing meets and help others to do the same. GKCA decreed that none but two-stroke engines are acceptable. This rule keeps karting costs down as there's not much you can do to soup a two-cycle and the best of them are inexpensive.

This is the big difference between the karts and the sub-midget race cars. You can sink real investment cabbage into the four-cycle [*Continued on page* 161]

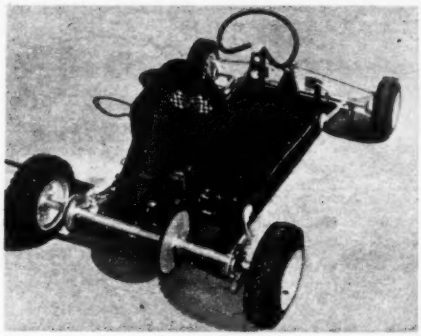
PUTT-NIK DRIVER leans into corner. The standard model sells complete for $140.

SPINSTER BOA has a streamlined fiber glass body on rugged tubular frame. The wheelbase is 42". Without engine: $198.



SPINSTER SIDEWINDER is available with an ice racing kit—runners for front axle, steel gripper rim for drive wheel tire.

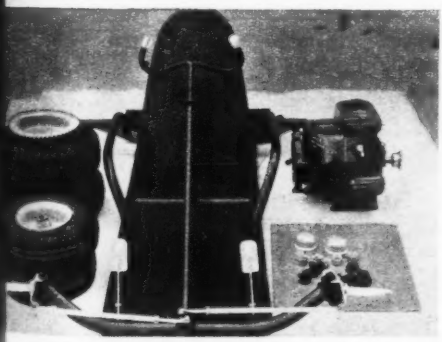
CUSTOM KART uses standard components from Go Kart Mfg. Co., two West Bend mills.



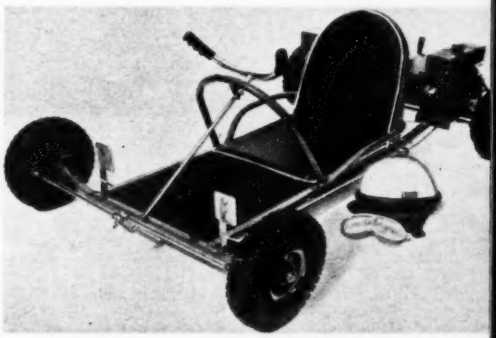
KURTIS KART sells complete ($440) or in kit form ($404). Engine is Yamaha 125.

WEST BEND Aluminum Co. tests two-cycle kart engines on track in Hartford, Wis.

ACER RACER uses Clinton engine, has seat plates. Kit: $130. Complete: $160.



SPINSTER KART KIT is designed for compact shipping, easy assembly. Available with or without engines. Price: $105-$169.



PIXIE KART comes with Clinton 2½-hp or Power Products engine. Prices range from $149 stripped job to $249 deluxe version.

McCahill Drives A Kart

"More fun than I ever dreamed possible!" says Uncle Tom after testing a Norseman Thunderbolt.

RAKISH McCahill corners like a real kart champ, shows off rig's twin power plants.

By Tom McCahill

WHEN a new craze catches on with the American public, it usually spreads like a dozen eggs tossed into an electric fan. The hula-hoop, yo-yo and miniature golf have all had their day but there is a newer and bigger fad sweeping the country that looks like it's here to stay.

Karts—miniature racing chassis powered by lawn mower-type engines—have become the biggest rage since Sally Rand fluffed her fans more than a quarter-century ago. I first got wind of the Kart Kraze from top automotive executives and chief engineers who, during lulls in conversation about their products, would yak about the karts

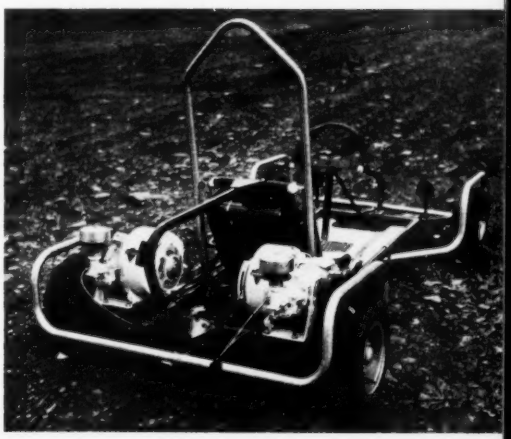
they were tuning for their kids. Bill Newberg, executive vice-president of the Chrysler Corp., cornered me one day in Detroit to ask what tire pressures I'd recommend for his boy's kart; Newberg himself was the kid's pit manager. Another night, at dinner in Daytona Beach with Duane Carter (famous Indianapolis driver and former head of USAC's Racing Division), he told me he was flying back home to Indianapolis that night because his son was racing a kart the next afternoon and he had to tune it up for him. Duane remarked, "It's one thing to pull a slight goof with a race car, but you'd better not make any mistakes with the kid's kart or you'll be disowned by the family."

In the Detroit region, General Motors, Ford and Chrysler battle it out every weekend on the race tracks of the small fry, as the fathers try to outsmart each other in preparing their kids' equipment. Many a big Madison Avenue account executive is now a kart fan and would rather bobble a client's TV spectacular than miss a race where one of his offspring was driving. Herb Fox, senior vice-president of Cunningham & Walsh and account executive for Texaco, spent 15 minutes talking to me via radio-telephone on my boat about how his son ran away with a race in New Jersey in his first try-out. If the kid had been elected to Phi Beta Kappa with an Oak Leaf Cluster, Herb couldn't have been half as impressed and neither could I. Another father-pit manager, who happens to be a part-time bank president, told me his boy used to be a baseball fan but now thinks the little leagues are for sissies.

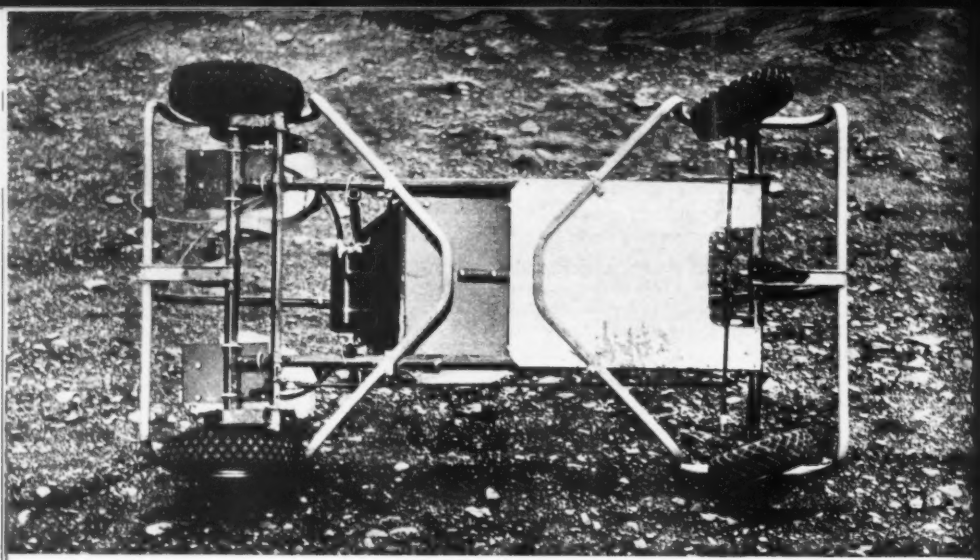
SPECIFICATIONS
Model tested: Norseman Thunderbolt K-6
Wheelbase: 50 in.
Height: 16 in.
Tread: 35 in.
Overall length: 62 in.
Fuel capacity: One gallon.
Weight: About 200 lbs.
Engines: (Two) Clinton single-cylinder, air-cooled, two-cycle.
Displacement: 5.76 cu. in.
Horsepower: 4.5 at 5,000 rpm.
Price: $354.95 (also available with other engines at various prices).

With my head bowed at the correct angle for modesty, I must tell you that I avoid most press parties and other large gatherings because I usually get torpedoed with "What's the new Cadillac *really* like?" or "Do you need a crowbar to get into a Corvair?" However, I'm happy to report that at the small functions I've attended recently,

LITTLE 200-pound kart fits easily in rear of wagon. Karts are not licensed vehicles.



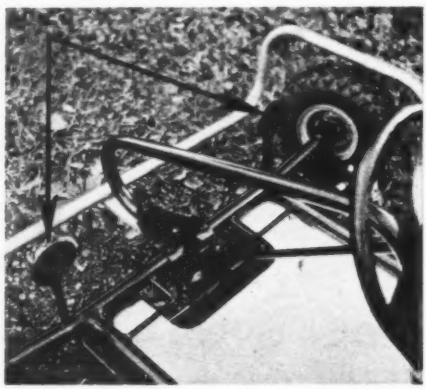
THUNDERBOLT has 50-inch wheelbase, 62-inch length, is 16 inches high without rollbar.



RUGGED kart has 1¼-inch, 14-gauge tubular steel frame, like top race cars.

I have been nailed by sensible, staid, businessmen who ask, "Is there anything I can do to hop-up the fuel for my kid's kart? He's racing this week." Recently at a field trial (of all places), where the somber-faced judges rarely speak to a contestant, my dog Boji was on his way to retrieve a duck when the judge came up to me and asked, "My boy wants a twin-engined kart. What do you think about it? He's only 15."

You may have gathered the impression by now that the decision to test a kart this month was not made on the spur of the moment. When I tested the MG-TC back in 1948, sports cars were practically unknown on these shores. Well, karts are not only known in 1959, they are *the* thing. I believe there's more interest in karts than any other type of racing (including Indianapolis-type cars, sports, Grand Prix and stocks) because it is a participant rather than just a spectator sport.



PEDALS (arrows) are the brakes, left, and the accelerator, right. Steering is quick.

Kart races are at this moment being conducted regularly in every section of the country. The course (due to the fact that karts aren't allowed on the highways and can't be licensed) is usually a parking lot, a section of an airport strip or a special layout. The typical Kart Kourse, which can be dirt or, preferably, hardtop, is 1/20th of a mile, 264 feet. However, many courses have been built on areas no bigger than 50x50 feet. Other courses have been designed with drag strips combined with obstacle courses of varying shapes. In other words, any place where you can find a quarter-acre or more of reasonably level ground can be quickly converted into a race track. At this writing there is a movement afoot to have a Pikes Peak run just for karts.

The biggest handicap a kart driver can have (aside [*Continued on page* 152]

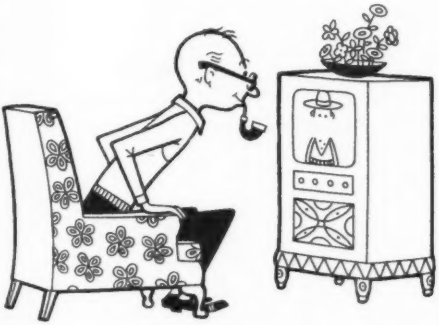
PUDDLE LIGHT that fastens onto handle of umbrella would be aid to puddle-skipping at night. Craig Walker, Melrose, Mass.

HEAT-UP MIXER with a hotplate underneath could "stir constantly while cooking," says Mrs. Pat Robson, North Royalton, Ohio.

ROLL-ON ANTISEPTICS would make minor repairs on family members quick and easy. Eugene Favret, West Roxbury, Mass.

INVENTIONS WANTED!

Is there a gadget you think should be invented? If so, send its description to Inventions Wanted Editor, MECHANIX ILLUSTRATED, 67 West 44 St., N.Y. 36, N.Y. Each one printed will be awarded $5.



TELEPHONE SIGNAL that flashes on TV screen so viewers will always "hear" the phone. T. Reininger, Thetford Center, Vt.

EDIBLE SPOONS made of some hard-baking cookie mix for the ultimate in disposability. Fern Greenwood, Concord, Calif.

AT HOME ON THE ICE, two Minnesotans spell each other at fishing and cooking pork chops.

FISHING THROUGH THE ICE

By Wynn Davis

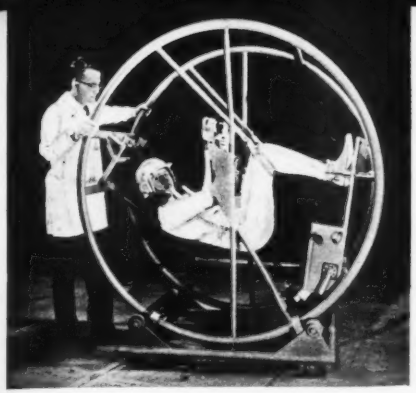
LAST January, while I was driving some friends along the snowbound shores of Lake Champlain, the 12-year-old son of my guests suddenly yelped, "Look! They've built a whole village on the ice."

I explained that what he saw was not a village but a group of ice shanties belonging to anglers fishing in them through the ice. This got everyone so interested I drove out on the ice so we could have a close look. Now my friends are fishing through the ice in their own shanty. It's that contagious.

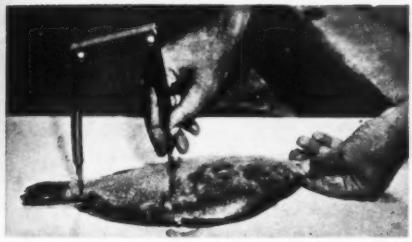
Most people today, living north of parallel 40, are used to seeing shanty towns far out on the ice. Ice fishing is one of the fastest-growing outdoor sports. The reasons are more lenient fishing laws, seasons extended to include winter, roads kept plowed all winter to the best lakes, heated automobiles and more leisure time and spending money for the average man.

Some ice shanty towns, especially in Minnesota, Wisconsin and Michigan, boast several thousand shacks including bait and tackle stores, food shops, hot dog and coffee stands, dealers in heating oil, real estate offices where anglers can rent shanties by day or week, and on large lakes where commercial fishing is permitted, markets where the anglers take fish to [*Continued on page* 163]

NOW SEE THIS!



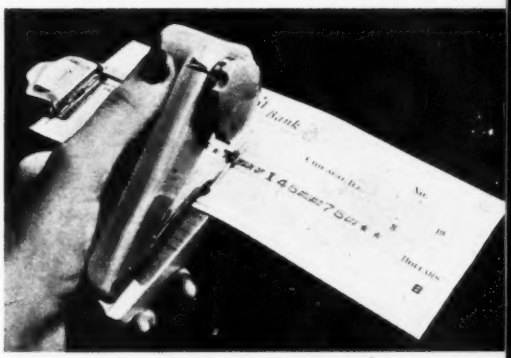
SEAT SUIT for tomorrow's space pilots is of nylon net with steel cables sewn into its seams. Its designer, Gary Graham of Boeing Airplane Co., models the suit in blastoff position. The whole rig, suit and supports, is called the "hammock-seat restraint system." Its purpose is to get spacemen through blastoff in good condition.



FIVE-IN-ONE, new angler's pal, can hold a tail and scale, as shown, or it can be used simply as a scaler. Or it can hold down head and tail for cleaning, or serve as a pole-holder for bank fishing, or as a handy icepick. I.M.D., Inc., Beloit, Wis.

MIDGET-LITE is a tiny no-battery flashlight that looks, at a glance, like a mere key-chain bauble. To keep it charged up you fit it into the recharger box, right, once a month. Globe has the five continents on it. German-made, sold by Hollis Co., Dept. 101, 1133 Broadway, New York 10, N. Y. $7.

1960 PORSCHE shows some changes that won't knock your eye out but, as its makers modestly point out, they derive from and have been proven by Porsche's racing experience. The bumper is now the height of American bumpers and has been wrapped around. Headlights have been lifted to light up more of the road and the steering wheel has been recessed. Porsche salesmen are also boasting of the new 90-hp engine and the continued absence of tail fins.



MINIATURE CHECKWRITER embosses any sum on any kind of check, making checks drawn on the humblest account as important-looking as those of big corporations. The steel-and-nylon machine fits pocket or purse. Order from ENRACO, 913 Forest Avenue, Evanston, Ill. The price is $9.95.

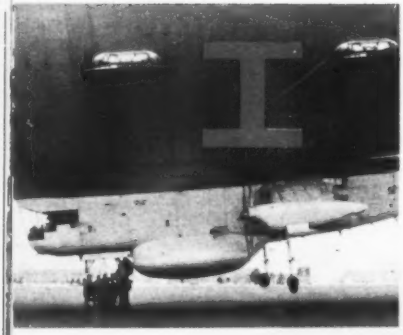
Will the "MERCY MIST" end wars?

By Arthur Kranish

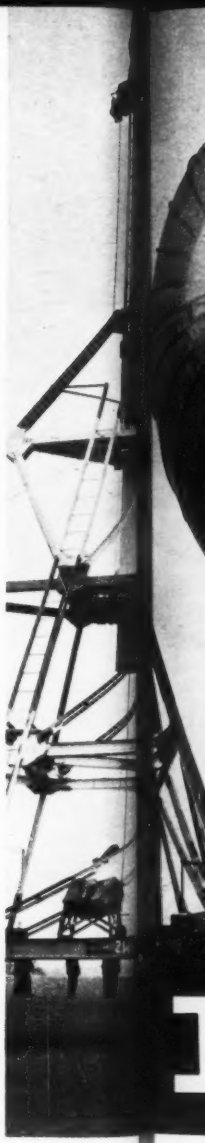
A GROUP of Congressmen sworn to secrecy meet behind locked doors in the nation's capital and watch in amazement as high-ranking military officers demonstrate America's newest weapon—so revolutionary that it may make atomic warfare obsolete.

On a table before the legislators is a bulky, glass-walled chamber containing two lively test animals. An Army Chemical [*Continued on page* 156]

By Harvey Gardner

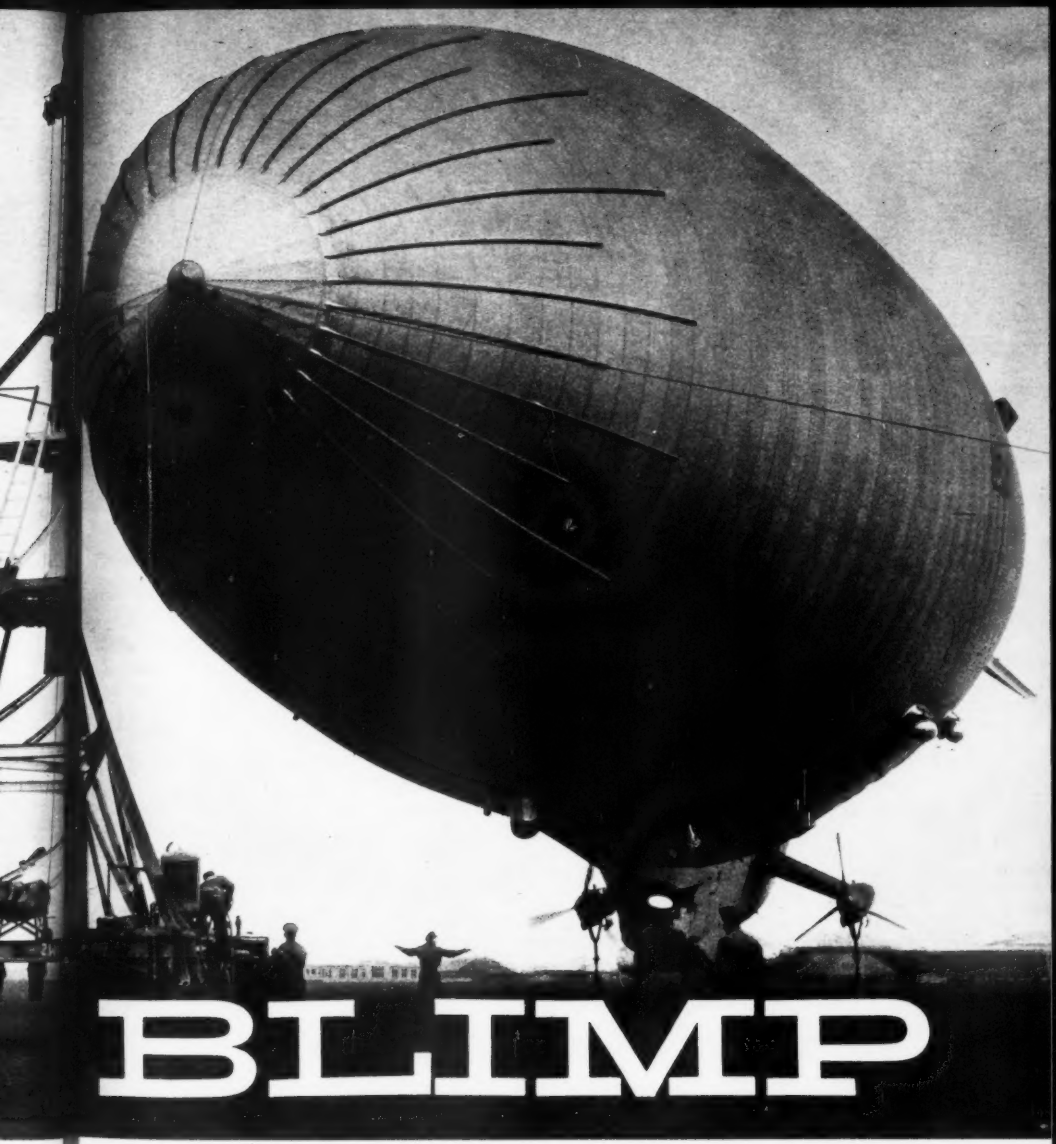


RODE A NAVY



I RECENTLY had the opportunity to take a ride in a Navy blimp flying out of Lakehurst, N. J., historic home of all the great Navy airships. For sheer heroism that can be matched, I suppose, but for satisfying an old, old urge to get off this planet, there's nothing like it. When I was a sprat, airships were great stuff. I once saw the Graf Zeppelin. I used to prefer airships because they stayed up longer and, as nearly everyone believed in those days, better. Many hours of fitful sleeping on commercial airplanes have never erased the urge to sail in a great ship of the sky.

The modern blimp deserves the description because it's *big*—342 feet from nose to tail and standing 107 feet high on its round rubber tires. I refer to the ZPG-2W—Z for lighter than air (*that's*



BLIMP

INCHING the bouncy blimp up to the mooring mast: work that calls for skill and cool heads.

easy, anyway), P for Patrol, G for Goodyear (because Mr. Goodyear's company makes them), 2 for second model and W for Warning.

My blimp had an ugly silver wart on the middle of its back and an inverted mushroom hanging from the belly of its car. The wart housed the altitude radar antenna, the mushroom housed the distance and direction-finding radar antenna. Carrying 22 men, tons of electronic gear, plenty of petrol, steak, potatoes and a couple of backgammon boards for off-duty entertainment, this airship can hang far out over the Atlantic for days and days, picking up the blips of aircraft and radioing positions and altitudes to an Air Force base ashore. There the Air Force usually identifies the blip as several dozen

I RODE A NAVY BLIMP

LIFE ALOFT includes coffee breaks. Right, I get a lesson in piloting from Lt.Cdr. Bowser.

schoolteachers coming home from Europe in a tourist-class plane. If the Air Force can't identify the plane, up go interceptors to hunt it down. Control of the interceptors can then be turned over to the blimp for guidance to the target.

In spite of the wart, my blimp was a prettier object than I expected it to be. Instead of looking like a factory smoker with a Dinky Toy glued underneath, the gas bag and the car of this ZPG-2W all seemed molded of the same piece of streamlined aluminum. Actually the bag, or envelope, was of neoprene-rubberized fabric about as thick as the lapel on your Sunday suit. There was no framework inside it but the nose had some stiffeners to help it butt into the wind.

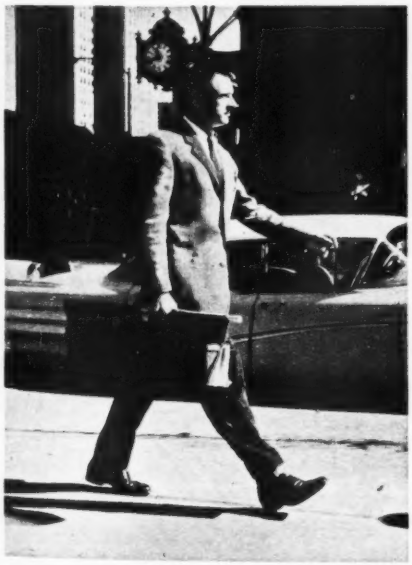
The bag held 1,000,000 cubic feet of helium in its huge single chamber. This colorless, non-inflammable gas expands and contracts [*Continued on page* 166]

RADAR antenna hangs from car: another tops bag. Blimps make fine flying radar platforms.

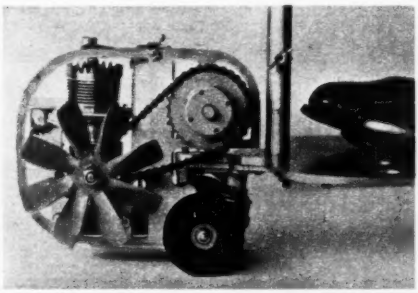
SKEETER is a little scooter that runs on a 1.32-hp model airplane engine. The scooter was devised by 29-year-old Louis Richards, a graduate student in Illinois Institute of Technology's Institute of Design. The power scooter weighs 12 lbs., consists of an 18-inch long aluminum platform and rides on figure roller skates. It is steered by leaning in the direction the rider wishes to go. The upright handle contains the ignition contact which starts the engine and the thumb throttle to control speed. Richards built the scooter for $70 but believes it could be mass produced for $50. Pretty nifty, eh? •

POWERED motor scooter travels three times faster than average man walks.

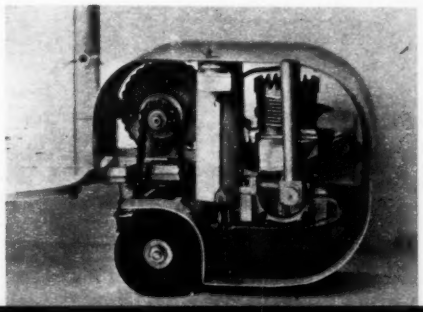
SKEETER-SIZE SCOOTER



SCOOTER measures 6¾x9½x29 inches when it is collapsed in canvas carrying case.



MODEL airplane engine powers the little scooter. Throttle on rigid handle is directly geared to the chain-driven wheels.

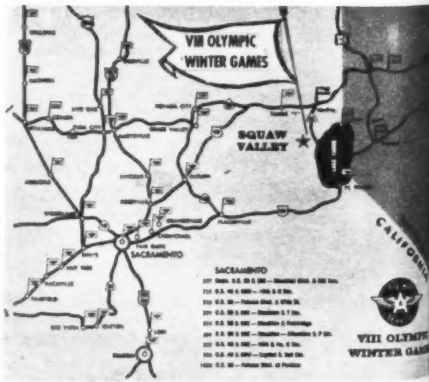


RINGING BELL signals skier to start and automatically triggers starting clock. A photo-electric device at finish will record the time.

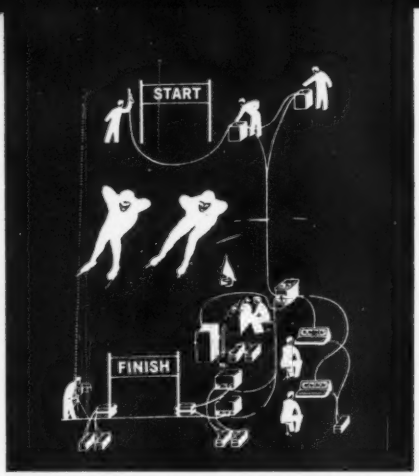
HOW THEY'LL TIME THE winter olympics

ATHLETES from 34 nations will compete at the VIII Olympic Winter Games at Squaw Valley, Calif., Feb. 18-28 in 1960.

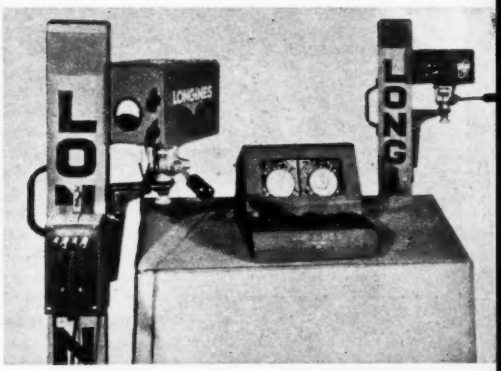
The official timer of the contests, Longines-Wittnauer Watch Co., is lending technicians and $200,000 worth of equipment to do the job. Hundreds of miles of wire will be used for the all-electronic timing circuits and the athletes themselves will automatically signal start, finish and elapsed times. The entire system will be dual in the event one fails—virtually an impossibility. There will also be a group of human timers with Longines watches—just in case! •



SNOW-DRENCHED Squaw Valley is 200 miles from San Francisco and 46 from Reno, Nev. 40,000 winter sports fans are expected.

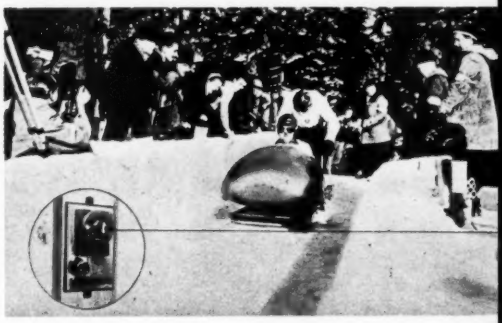


SPEED SKATING events require 12 official timers and technicians. System records competitors' time to 2/1000ths of a second.

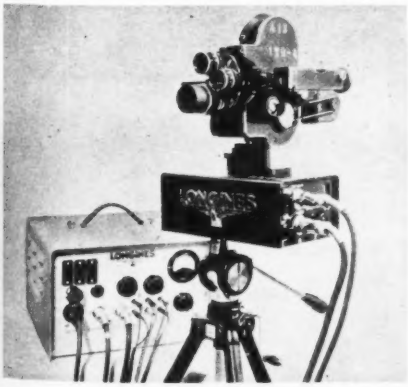


ELECTRIC EYE at start and finish line of ski slope would be hooked into battery of six timers, each clocking run of one skier.

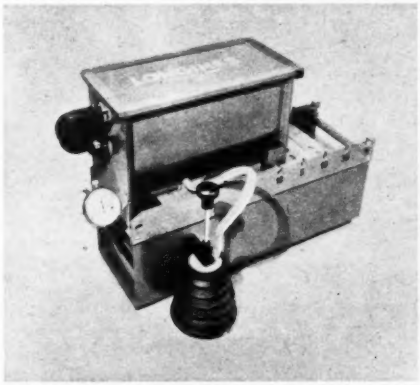
MAGIC EYE finish line has photo-electric cell set up on each side of it to insure completely automatic and errorless timing.



BOBSLED contestants break thread at start and finish of race; the printing timers at finish automatically record sled's time.



CINETIMER starts on impulse from firing gun and at proper time provides a finish-line photo—at up to 100 frames a second.



FILM taken by the Cinetimer is processed by this machine in just 60 seconds. It can then be viewed through special attachment.

MONEY MAKING IDEA

TOTEM POLE TYCOONS

TWO Long Beach, N. Y. school teachers have put the Indian sign on an unusual new business that is bringing extra wampum to their teepees.

Their product? Totem poles—authentic reproductions of those carved and painted columns set up before the homes of Indian tribes of the Northwest.

Paul Feinman and Spencer Michlow purchase cedar poles from a local lumber yard. The poles average about 16 ft. in length, weigh 200-300 lbs. After stripping with a drawknife, the outlines of animal, bird and human heads are drawn on the pole with a crayon.

Designs are copied from books of Indian lore. The gargoyle faces are chiseled into the pole, then wings or other projections added. Final painting is done with stains and enamels. The finished poles sell from $125 up. The customers? Camps and trading posts that are delighted with these replicas of Indian handicraft. —*Rudy Arnold*

PROUD CARVERS support 16-ft. pole: $125.

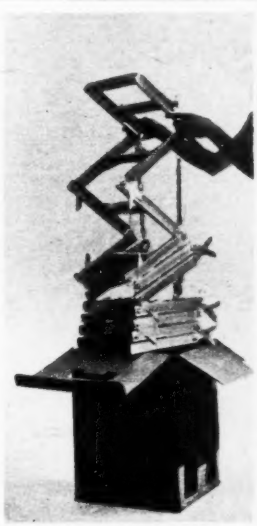
PAUL FEINMAN uses drawknife to strip off bark.

SPENCER MICHLOW uses wood chisel for the rough carving.

FINAL PAINTING is done in stain or enamel over primer.

MIMI

MIMI's the gay little escapist this month. She's discovered the "Easy Out" lightweight magnesium ladder that neatly folds up when not in use. Hooked into a firm wall plate (it comes with "Easy Out") and dropped to the ground, the ladder straightens to its full length and locks rigidly into shape. Telescopic arms unfold against the wall, adding firm support and preventing wind sway. It comes in eight to 20-foot-plus lengths. $2 a foot. White Metal Rolling & Stamping Corp., 443 Fourth Avenue, New York 16, N.Y.



McCAHILL TESTS

THE '60 Plymouth

Tops in looks and performance, the new Plymouth is quite a versatile package, says Uncle Tom.

By Tom McCahill

PLYMOUTH has less chance of outselling Ford or Chevrolet this year than I have of growing hair—but that doesn't alter the fact that, to my way of thinking, it's the best car of the Big Three from quite a few angles.

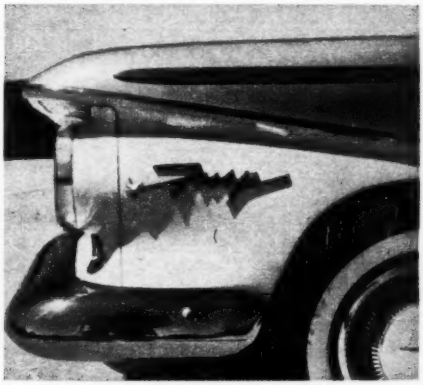
As Priscilla might have said to John Alden, "Jack, have you heard what they've done at Plymouth? They've Unibodied it!" Now, if Jack was as hip as Mack the Knife, he might pop back with, "What's the difference between

PLYMOUTH, which has new Unibody construction for 1960, has been sharpened up considerably in the styling department, says Tom, who rates car the best-looker in its particular class.

WORLD'S No. 1 trunk-tester leans on his spare. Hard-working Jim says, "A big bin."

VIEW from the side reveals restyled front fender hood, larger rear window, less fin.

VERTICAL taillights set in new canted fin replace horizontal lights that marked '59.



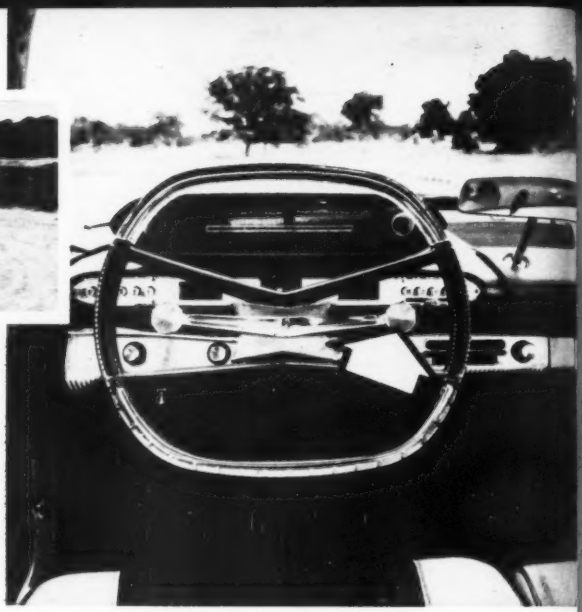
AIR-CATCHING aspects of new fender hood design are appreciably reduced, says Tom.

Unibody and Unitized construction?" Priscilla would probably answer, "Guess it depends on who's saying it."

Anyway you slice it, the biggest news in the Chrysler camp this year is the switch-over to Unibody construction, which means the body and frame are now one welded, undivided unit. This results in a number of things (as VW pointed out many years before): Less squeaks and squeals per square inch and fewer rattles, by the very simple expedient of eliminating all body bolts used with the conventional frame.

The 1960 Plymouth is the performance king in its field, either breaking away from a traffic light or flying through a speed trap. Tie this up with the fact they are the best road and cornering cars of the Big Three and you have quite a versatile package.

In 1959, a Plymouth with the Golden Commando engine won the Big Three title at Daytona Beach by outrunning all Fords and Chevrolets. However, you'll never find this in the record books. Due to a clerical goof, the Automobile Manufacturers Association specifications for Plymouth called for a certain size valve. These specs were filed several months before actual model introduction and were not revised. However, though no 1959 Plymouth V8 was manufactured with valves other than the size raced at Daytona, the officials had no choice but to disqualify the car when a competitor pointed out that the valve size was not that called for in AMA specs. Regardless, an absolute stock Plymouth *did* make the fastest time on the beach in its class—even though it didn't win the cherry



TOP torsion-bar suspension lets Plymouth drill through hard bends and switchbacks as adroitly as many top sports cars, according to Uncle Tom.

AERO steering wheel is new optional for '60. Square shape provides more legroom, visibility. Button bar (arrow) on wheel is to toot the horn.

bowl which it rightfully deserved.

Stylewise, the 1960 Plymouth has been sharpened up considerably. Though the writer feels it's the best-looking car in its field as is, perhaps more drastic changes could have been made almost for free in 1960. To switch over to Unibody construction called for an entirely new set of dies and tools which would seem the opportune time for a completely new styling approach, if such a play were planned for the near future. Maybe there are no major style changes due for some time?

A fast tour around the 1960 Plymouth shows a lot of thought has gone into it, though some of the changes might appear minor at first glance. For example, the headlights are still nestled under the bulge of the hood. However, this air-catcher has been reduced appreciably—in fact, enough to save several horsepower at 90-100 mph. The rear deck line is quite similar to 1959's, with just a little bulge difference in the 1960 version. Anywhere you look, if you have a '59 handy for comparison, you'll find a number of minute alterations—none of them of world-shaking consequence.

An innovation this year, which I had on my test car, was a squared steering wheel. This is optional equipment. To me, it seemed like steering with handlebars. It's not something I expect to see sweep the automotive world. The vent windows on the 1960 Plymouth pull in from the front instead of pushing out from the rear which, believe it or not, makes them easier to use. The back of the driver's seat on the Fury I tested was considerably higher than the passenger's seat to give more comfort on long treks. The foot throttle has been moved forward to allow for greater legroom and comfort and the car has more shock control [*Continued on page* 153]

TEST CAR SPEC

MODEL TESTED: **1960 Plymouth Fury**

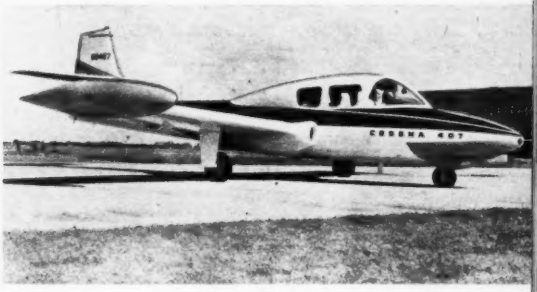
ENGINE: **V8** cyls; **361** cubic ins; **305** brake hp; **395** ft-lbs max torque; **10** to **1** compression ratio. Bore **4.12** ins; stroke **3.38** ins. Fuel required: **Premium.** Standard axle ratio: **3.31.** Wheelbase **116** ins; length **209.4** ins; height **54.6** ins; width **78.6** ins; front tread **60.9** ins; rear tread **59.7** ins. Weight **3,610** lbs. Gas tank capacity **20** gals. Turning circle diameter **42.3** ft. Tire size **7.50X14.**

PRICE (without optionals): **$2,624.50**

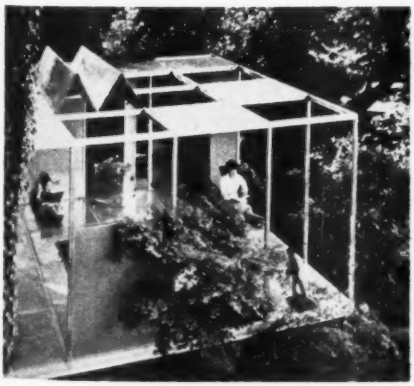
PERFORMANCE: **0-30** mph, **2.8** secs; **0-50** mph, **6.3** secs; **0-60** mph, **8.2** secs; **40-60** mph, **3.9** secs. Top speed **120-plus** mph. All times recorded on corrected speedometer.

NOW SEE THIS!

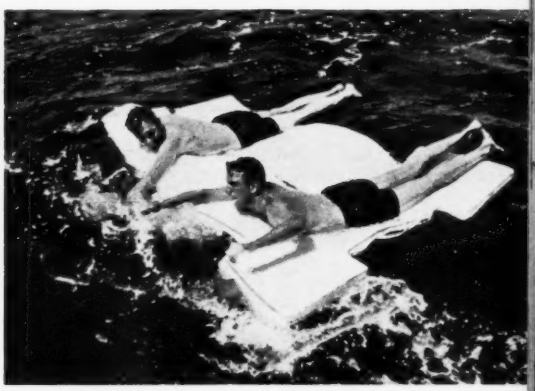
WE'VE JUST sampled a Portable Martini and Manhattan—craftily mixed cocktails sealed in plastic bags—and it's the greatest idea since they started putting prizes in Crackerjack. Brown & Rowland, a product publicity firm, dreamed up the Portable Martini to demonstrate the qualities of Scotchpak, a special vinyl plastic envelope made by the Minnesota Mining & Manufacturing people. The plastic in no way affects the taste of the mixed drink and the smooth little pouch is easily opened by snipping off one corner with scissors. Sorry, not available commercially yet, unfortunately.



MODEL 407 is Cessna Aircraft Co's. new military utility aircraft. The low-wing, pressurized-cabin jet is a four-seat job which also accommodates the baggage of its passengers. The craft has a gross weight of 9,300 pounds and a mission range of 1,380 nautical miles. The plane is powered by two Continental 356-9 jet engines which produce 1,400 pounds of thrust each and give it a maximum speed of 487 mph. Cruising speed is 465 mph and normal cruising altitude is 35,000 feet. The engines operate ice-free under all conditions as does the windshield of this good-looking aircraft.



VIEW BOX designed by John Matthias for the Aluminum Co. of America, is a complete 16-foot-square structure which stands eight feet tall. It can be carried to the site, erected without tools, and sits on adjustable stilts, which means you can set it up on a hill and have a completely level floor. It can be partially open, as in the photo above, or completely weather-tight.

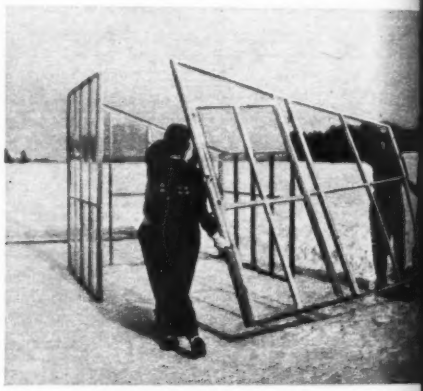


FLOATING cushions developed by the U. S. Rubber Co. are made of vinyl sponge called Ensolite. The cushions can be used as seats aboard a boat or tossed into the water for fun. They also snap together to form an emergency life raft. Ensolite is also highly shock-absorbent and an egg dropped from a ten-story building would merely bounce, not break, on these super-soft cushions.

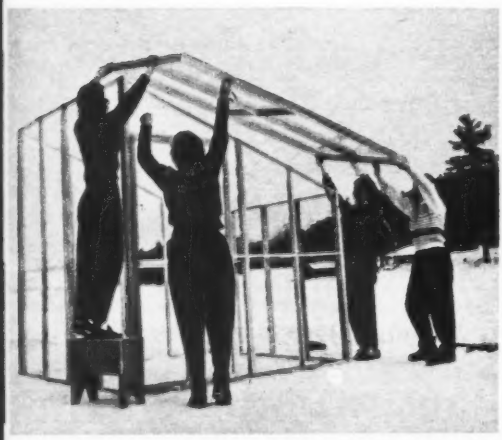
PLASTIC SOLARIUM

A NEW plastic that lets through almost 100 per cent of sunlight is being produced by American Sisalkraft Corp., Attleboro, Mass. Of the many very good uses to which the new material may be put, we present here one of the most delightful. Fishing and sunbathing on the ice is now quite feasible in a Sisal-Glaze shanty. Unprivate but very warm on a sunny winter day, the plastic shanty has another advantage—it knocks down easily for transportation. Fishermen traveling any distance do not want to tow a hut on runners. With a Sisal-Glaze shanty you can move from lake to lake all winter. Lumber dealers sell the Sisal-Glaze, lumber and fastenings, give away plans. Or you can get plans free from Sisalkraft. Cost of your plastic shanty: about $100. •

SECTIONS are light to handle; girls can do the entire job easily without male help.

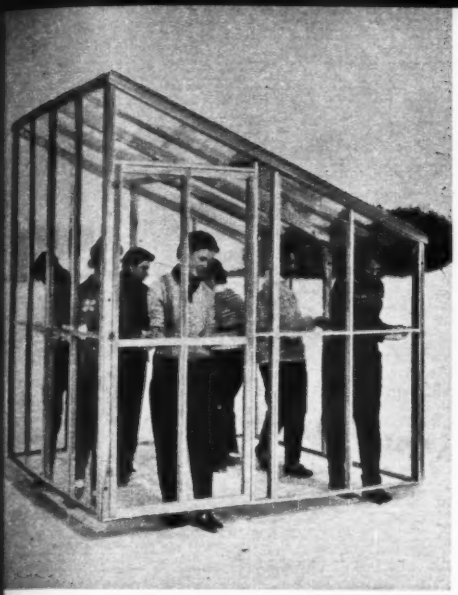


DOOR SECTION goes easily into place. Roof section also has a ventilation port.



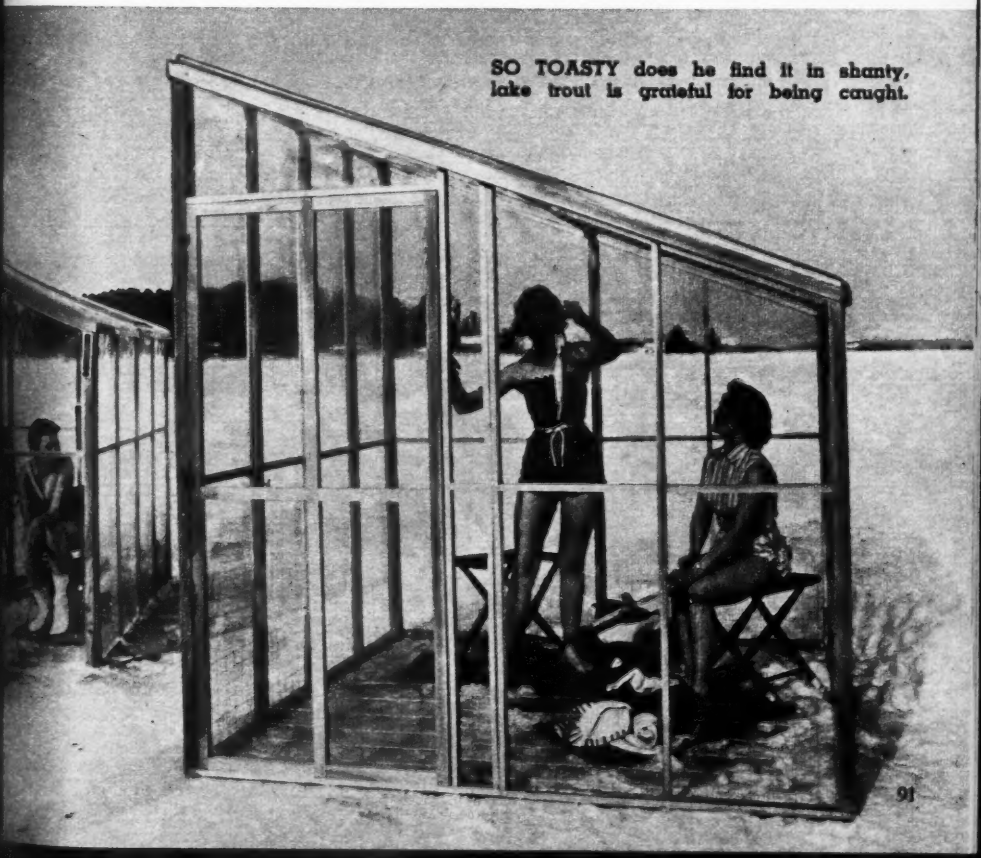
ROOF PANEL finishes the structure. A fishing stool gives girl needed height.

BOLTING is a finger-power task; here goes one fastening in the two-panel roof.



HOUSE MOVING to another spot is a light matter. Assembled shanty weighs 140 lbs.

TEMPERATURE outside is 30 degrees: inside it's 70 and may go as high as 80.

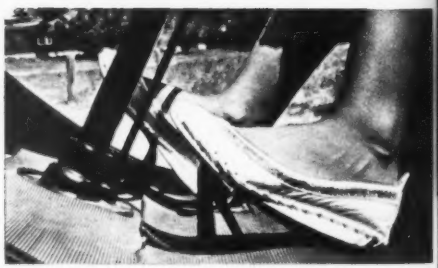


SO TOASTY does he find it in shanty, lake trout is grateful for being caught.

YESTERDAY'S CAR OF TOMORROW

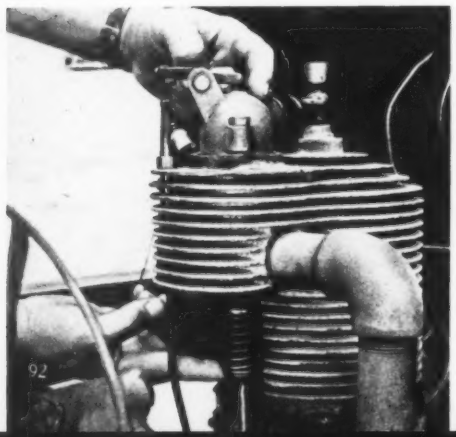
SHIFT LEVER mounted on steering wheel column was innovation. Below it is the gas lever.

THE Crestmobile shown in these photos was an engineering wonder of its day—far ahead of competing autos. The 8-hp engine was air-cooled and a shift lever on the adjustable steering wheel eliminated the foot clutch. Other modern features were steel wheels, floating engine, drive shaft and a lift-up hood. The car weighed about 1,000 pounds and the two-seater sold for $800. It was the "Dream Car" of 1904! •



FOOT PEDALS were simplicity itself: left pedal for brake, right pedal for reverse.

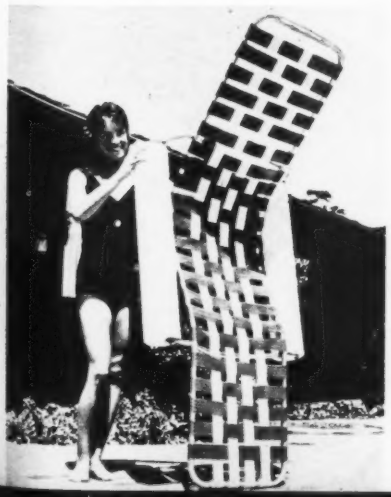
F-HEAD ENGINE was one-cylinder, mounted on its own frame to reduce the vibration.



CRESTMOBILE is still being driven at the Carriage Cavalcade, Silver Springs, Fla.

IT'S NEW!

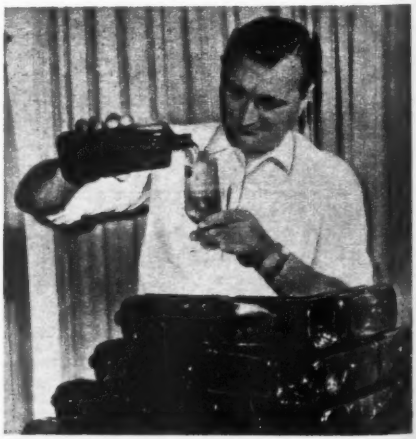
TOTE GOTE, new off-road scooter, has five mph top, will tote up to 400 lbs. anywhere.



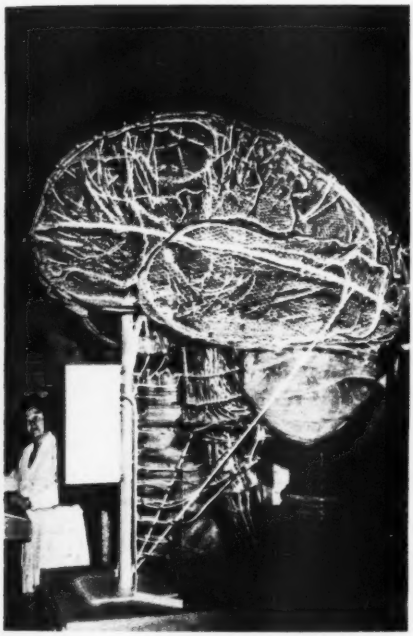
AQUA-LOUNGE, for lazy pool-users and sensation-seekers of the more somnolent type, combines elements of the deck chair with glass fiber pontoons. Reflin Co., San Diego, Calif. Price $45.

ELECTRIC PLOW on Southern Pacific handles 50 per cent more snow than old steam plow.

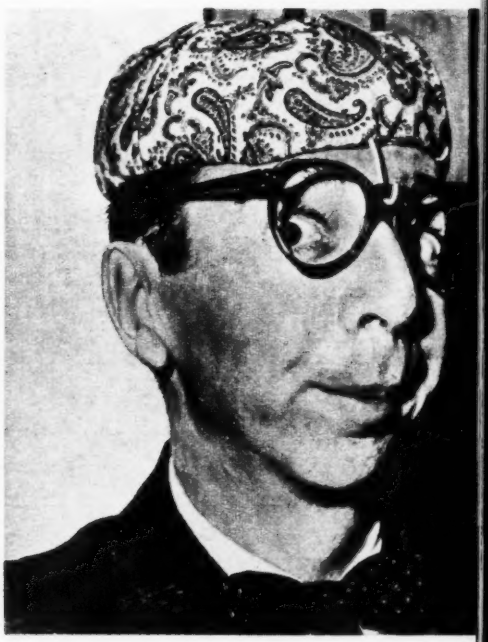
ECHO, for big-room radio sound in a small room, is made by tube delaying sound between mike (right), speaker. From Germany.



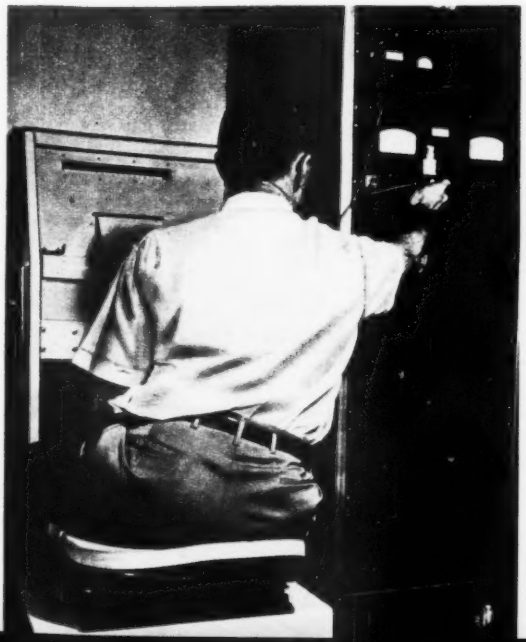
BEER IN BRICKS is the last burp from Beerland; German maker says these bottles pack tighter. Necks fit into false bottoms.



BIG BRAIN—the world's biggest artificial one—was displayed at a scientific exhibition in Vienna. Over 600 small lamps depicted functions and reactions of the brain.



EYE-POPPER Arnold Stang popped a for-real invention recently when his doctor told him not to rest specs on an injured schnoz. Here's how he solved the problem.



LIFESAVER SEAT can lengthen lives of long sitters. UCLA development employs two universal joints placed so that weight is borne by "sitting bones" instead of thigh, thus keeping pressure off veins, improving the sitter's circulation.

FASTER than the wind

A COOL 60 MPH is a breeze for these devotees of solid sailing in their modern iceboat.

SLOOP RIG, aft rudder, mark older or homebuilt craft.

By Laurence M. Whyte

ACROSS a belt of frozen lakes and rivers stretching through New Jersey, New York, New England and the northern Midwest, men, women and children have been bitten by the ice sailing bug. They go to outrace the wind—and if there's any wind at all, they win every time.

With a steady 15-mile-an-hour wind, an iceboat will scud over a lake at a speed of 45 to 60 mph. Even with no friction at all, which is what you almost get on the polished runners of the iceboat, that seems impossible. How is it done? Briefly, any sail moving across or into the wind is able to do so because the movement of air over its airfoil-shaped surface creates a partial vacuum on the leading side and so produces a forward push. This vacuum force, operating on the nearly frictionless iceboat, makes it go faster than the surrounding air, which air then

FUSELAGE and cockpit mean a factory-built: humbler boats use simple platforms.

SIMPLE DESIGN of the three-runner iceboat tempts many to build their own craft.

becomes what is called the boat's "own apparent wind" because it has, in effect, become wind in relation to the moving boat. This OAW in turn increases the vacuum and consequently the speed and —well, this would go on to catastrophe except that there *is* some friction between runner and ice to halt the further increase of speed.

Due to this effect the iceboat goes faster sailing into the wind or off it than when running before the wind. With a following wind the speed of the boat is only that of the last puff of air.

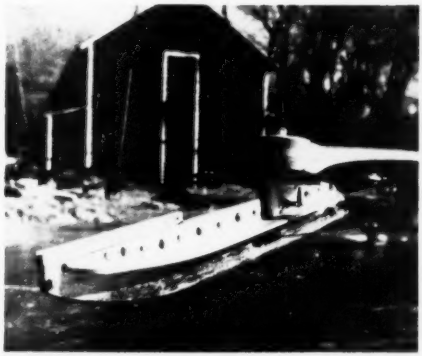
Until the age of gasoline motor propulsion, man never went faster than when his sails skimmed over ice—except when falling. In 1908 an iceboat on the Shrewsbury River of New Jersey was clocked at 140 miles per hour. Years before that, ice captains on the Hudson River were speeding ahead of New York Central trains.

The Iron Horse, though, never had to worry about commercial competition from iceboats. Ice boating requires specific conditions—wind, hard freezes, and a fairly moderate snowfall. Many mountain regions have lakes aplenty, but heavy snow prevents sailing.

Besides the areas mentioned in the United States, as well as parts of Canada, northern Europe near the North and Baltic Seas is the only region noted for ice yachting. Holland may have been the birthplace of the sport. Mid-18th-century accounts describe a Dutch sailboat mounted on runners—hull and all.

Shortly after the American Revolution, ice craft [*Continued on page* 152]

MASKS protect the ice sailors against a cold that can be agonizing and dangerous.



RUNNER of spring steel, like skate blade, controls direction with minimum friction.

BRIGHT IDEA
AWARD
MECHANIX ILLUSTRATED

Kik-Step

KICK Kik-Step in the direction you want it to go. Then step up on it to get at that high, hard-to-reach shelf. The 14-inch-tall steel stool has non-marking casters mounted on springs. When you step on it, the plastic base grips the floor. Safe, handy: $13.95. Cramer Posture Chair Co., 625 Adams Street, Kansas City, Kan. •

KICK it—it won't fight back—and Kik-Step will roll to selected spot.

CLIMB aboard to get at hard-to-reach spots in cupboard, clothes closets, kitchen shelves, etc.

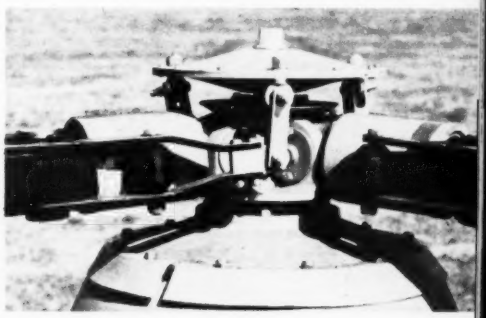
WIN $50

MI will award $50 each month to the first person who tells us of a new and useful gadget that is patented and in production. Manufacturers are also eligible for this award. Pictures and a description should be sent to Bright Ideas Editor, Mechanix Illustrated, 67 West 44th Street, New York 36, N. Y.

NON-MARKING casters have springs which retract when you hop on the sturdy device.

NEW FRENCH AUTOGIRO

HELICOP-AIR of Paris has come up with a new autogiro with a mere 1,375-pound gross weight. The prototype, powered by a 90-hp Continental engine, cruises at 87 mph. The tiny craft has a 19-foot wingspan and is 20 feet long. It will cost under $10,000. •



THREE-BLADE rotor head has pitch control for revving up before the craft takes off.

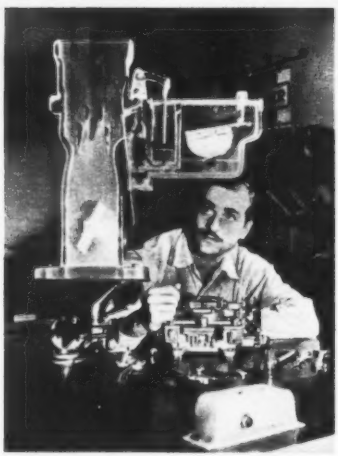
GIRHEL has two-place, side-by-side seating. Minimum speed: 19 mph. Top speed: 103.

TRI-TAIL autogiro has two elevators in tail for directional control up and down.

CAR DOCTORS WANTED

By Stanley Brams

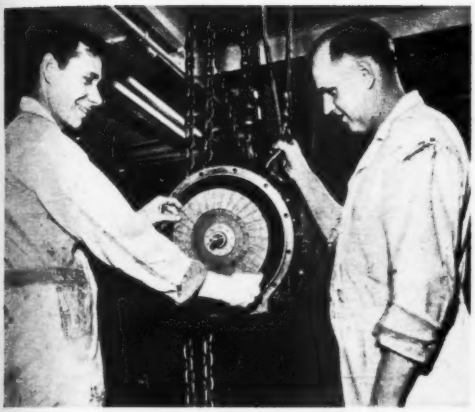
CHRYSLER students at Rye, N. Y., boning up on transmissions and rear axles and their servicing.



CARTER Carburetor school student studies giant breakaway.

IF you have mechanical leanings and if you want to work in a field that needs you, by all means take a look at the opportunities awaiting automobile mechanics. Look at the statistics: In 1957 there were 67,225,000 autos on the road and 775,000 mechanics. An industry estimate of the autos on the road in 1967 is 85,000,000. To maintain today's ratio of about 87 cars, trucks and buses per mechanic, about 975,000 mechanics will be needed in 1967. That's 200,000 more than are available today.

Sound promising? That's only the begin-



FORD apprentice works on lift truck part under the watchful eye of a factory mechanic.

DeVILBISS spray-painting course; special training for the ambitious mechanic.

GM students learn how the converter pump works in the Dynaflow transmission.

ALLEN Electric and Equipment Co. course trains mechanics on Allen testing gear.

ning. Many of today's mechanics will go out of the labor market during the next ten years. Actually about 20,000 direct replacements will be needed annually. That makes another 200,000 jobs available beyond those already needed for expansion. Somewhere between 40,000 and 57,000 new mechanics will be needed every year.

So any good mechanic is assured of a job. Where does the job lead? There are many possibilities. Take Harry M. as an example.

Harry could time and balance an engine as sensitively as a piano tuner tunes a Steinway. One day an owner of race cars watched him work. Since that time Harry has been on the race enthusiast's payroll, making his racers sing, seeing the country and earning top money.

Or take Kurt S. He graduated from mechanic to service representative in a dealer's garage. He could diagnose troubles fast, accurately. Pleased customers wrote [*Continued on page* 158]

BUILD MI's KART

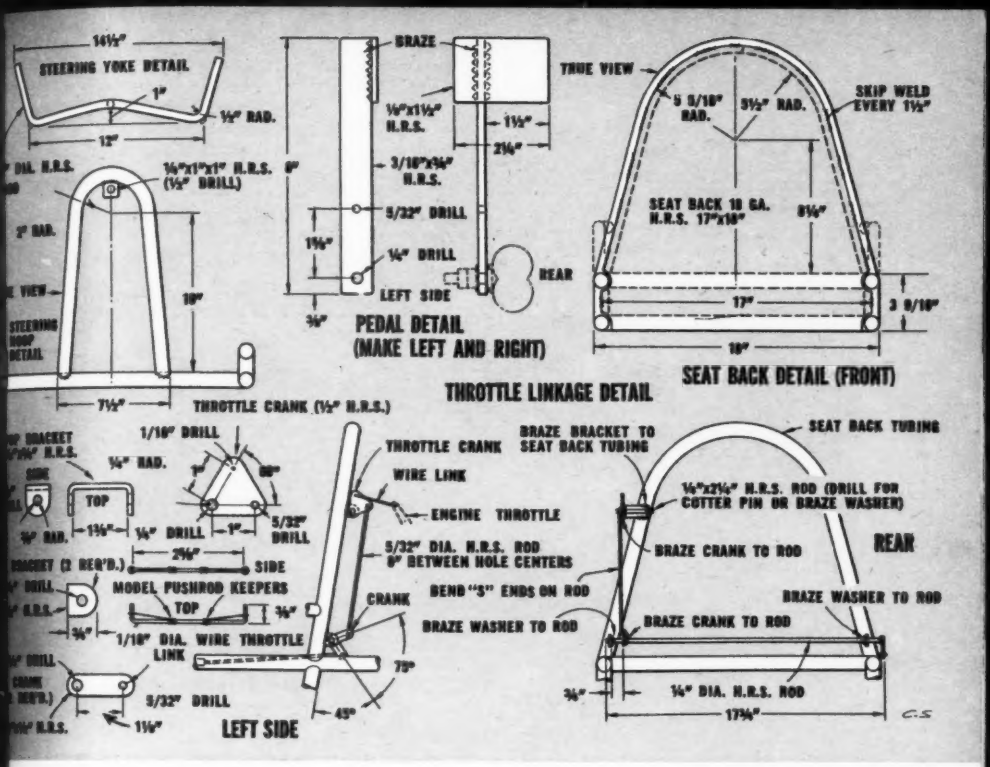
A 2½-hp lawn mower engine drives this kart at more than 30 mph. It's Class A fun for anyone.

By S. Calhoun Smith

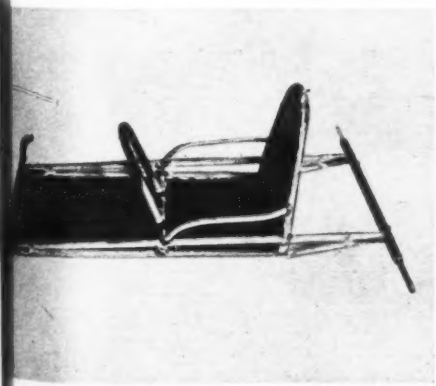
THE "go kart" has taken the U. S. by storm. A happy wedding of lawn mower engine and steel tubing on four little wheels, it has become a craze among kids and adults with a yen for racing or just plain driving fun.

Kart racing originated in California and has spread eastward since 1956. Now the GKCA (Go Kart Club of America) is firmly established and has set up sensible rules governing design and power for stable, safe "karting." Even the lowest powered Class A, 2½-hp karts are capable of 30 to 35 mph with an adult aboard and more when driven by a lightweight 10-year-old. Races are run on paved parking lots and small dirt ovals and regular sports car type raceways have been built with tracks four-tenths of a mile in length and 20 feet wide. Such tracks incorporate eleven turns, both banked and flat.

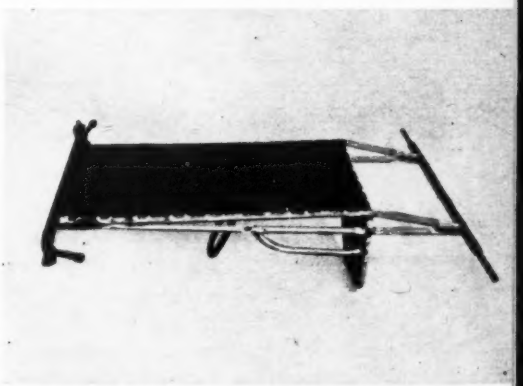
The MI Kart was designed and built by Bob Peru of Red Bank, N. J. and can be considered a basic Class A kart. It complies in all respects with GKCA



specifications. Cost runs from $100 to $110 complete with an A-400 Clinton engine. Peru did the welding himself but anyone not equipped to do it would have to spend $20 to $30 extra. The building time was about 25 hours and the tools required were a square, hack saw, tin snips, files, hammer, large vise and an electric hand drill or drill press. To help hold cost down, the frame is made of thin-wall conduit, but more expensive chrome-moly tubing could be substituted throughout. Some parts, the seat and steering hoops, steering

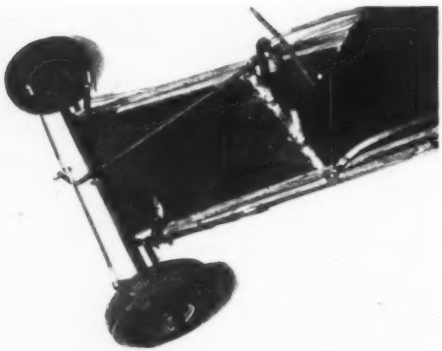


COMPLETED FRAME with axles installed; a thin-wall conduit is used to reduce cost.



BELLY PAN and seat back are sheet steel; they're spot-welded to the conduit frame.

SPINDLE AND BRACKET (SEE DETAIL)
PEDAL PIVOT STUD (WELD ¼"x1" C.S. TO FRAME)
ALL FRAME MEMBERS ¾" I.D. LIGHT WALL CONDUIT EXCEPT AS NOTED
AXLE (⅝" DIA. C.R.S., ⅝" N.F. THREAD FOR 1¼")
BUSHINGS (½" I.D.x1" IRON PIPE BRAZED TO AXLE PIPE)
AXLES (¾" I.D. BLACK IRON PIPE)
¼"-28 RETAINING BOLT DRILL AND TAP AXLE
FOUR FAIRLEADS (7/16" O.D. TUBING, 1½" LONG)
BRAZE
18½"
12"
7"
¾"
¼"x1"x1" H.R.S. (½" DRILL)
¼"x1"x1" H.R.S. (½" DRILL)
¼"x1" C.S. (TWO)
20"
NO. 6x½" S.M.S. (3" APART THROUGH BOTTOM)
STEERING SHAFT AND YOKE (½" DIA. H.R.S.)
CUTAWAY
TOP ONLY
BELLY PAN (18 GA. H.R.S., 17"x37")
19"
STEERING HOOP
7½"
SKIP WELD PAN TO BOTTOM 1" EVERY 2"
⅝"
3½"
FAIRLEAD
5/16" DRILL (FOUR SLOTS)
6¼"
2¼"
12½"
21½"
ENGINE MOUNT PLATE ¼" H.R.S.
2¾"
1 7/16"
½"
SCREEN DOOR SPRING (1/16" WIRE, ½" DIA., 3½" LONG)
BRAKE ROD DETAIL (THROTTLE SIMILAR)
5/32" DIA. ROD, 50" LONG
BRAZE ¼" LONG TUBING STOP TO ROD
PEDAL
FAIRLEAD
HEIM BALL ENDS (⅜" DIA. ROD, 12" LONG, ¼"-28 THREAD)
INCHES
SIDE VIEW
STEERING YOKE
SEAT HOOP
BRAZE
24¼"
28"
½" I.D. COLLAR WITH SETSCREW
TUBING SPACER (¾" LONG)
¼"x1"x1" H.R.S. (½" DRILL)
16½"
BRAKE PEDAL (SEE DETAIL)
SISSY RAILS (½" I.D. CONDUIT)
STEERING SHAFT
9"
¾"
70°
5"
2½"
80°
1"
1½"
1⅜"
2½"
7"
INDICATES WELD
3½"
7/16"
BRAKE PIN
¼" DRILL
22⅝"
14"
12⅜"
48" WHEEL BASE
Cal Sam



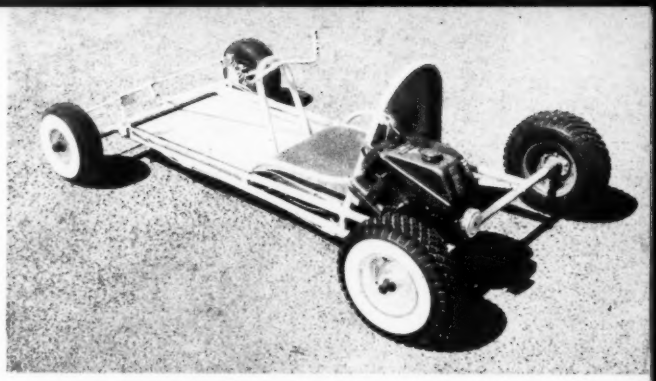
FRONT END view shows brake and throttle pedals and the simple steering mechanism.

SPOT BRAKE pivots flush against inside face of sprocket. Note engine mount plate.

yoke, front wheel spindle brackets and engine mount plate, can be purchased ready-formed from various kart manufacturers. Their use will speed building considerably.

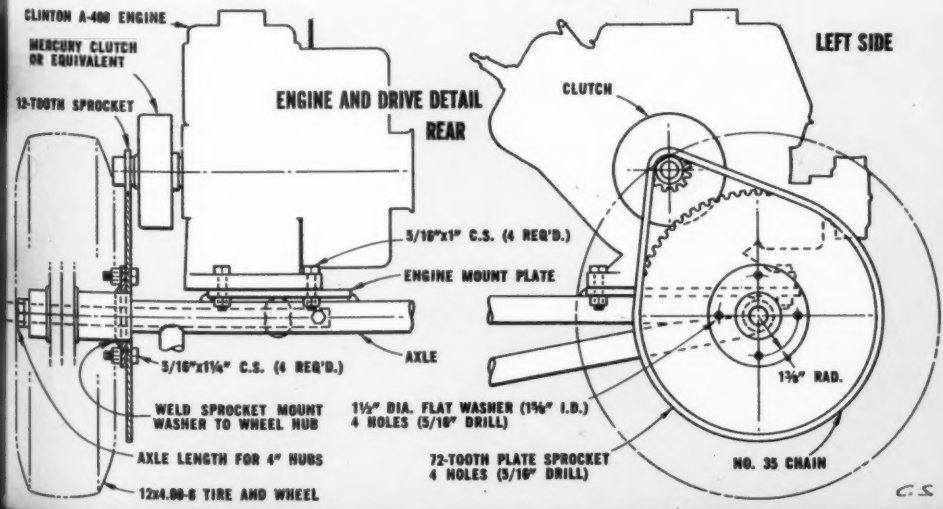
Begin construction by drawing a side frame outline on a piece of scrap lumber. Cut and flare the tubing required and heat the lower piece to make the bend. Fit the pieces over the outline and clamp them. Then tack weld all joints and remove the framing from the board. Using the first side as a pattern, clamp the parts of the second to it and tack weld them together. This will insure uniformity.

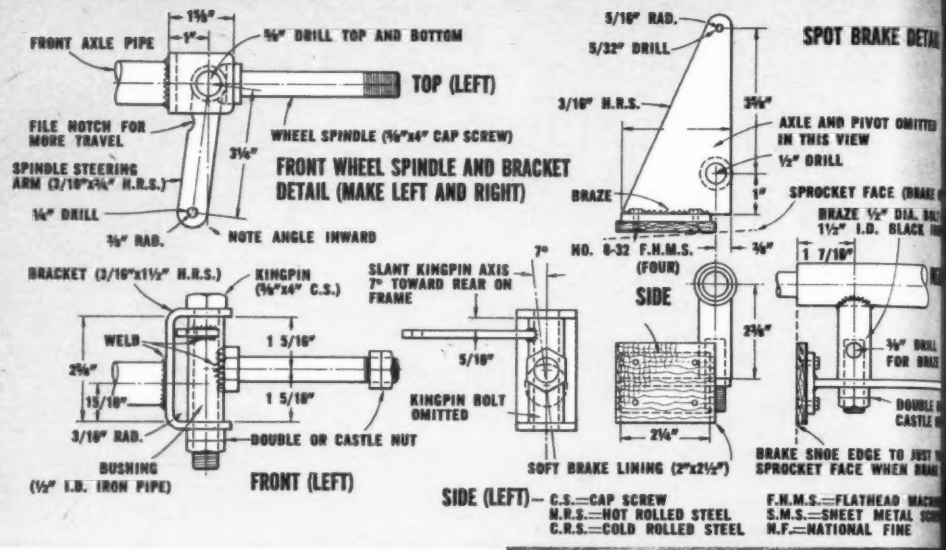
Next fabricate the front and rear axles. Bend the front wheel spindle brackets to shape and drill them for the kingpin bolts. Then weld them to the front axle tube. Align them carefully, square on the tube ends and parallel to each other. The rear axle tube ends are bushed



CLINTON 2½-hp engine drives MI kart at more than 30 mph with adult load; note throttle crank on seat hoop.

SPANKING NEW kart is ready to go. You can upholster seat but boat cushion from marine supplier does nicely.

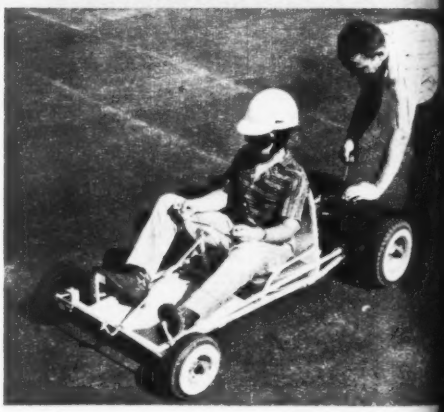




with a length of pipe to reduce the inside diameter for the ⅝-inch round stock axles. The axles are held in the tube with a quarter-inch bolt near each inner end. They can be tapped for short bolts or holes [*Continued on page* 150]

LARGE-SCALE PLANS

include a complete bill of materials. Order your set by sending a $2 check or money order to MI Plans Service, Fawcett Bldg., Fawcett Place, Greenwich, Conn. Specify Plan No. WB-2, MI Kart, when ordering.

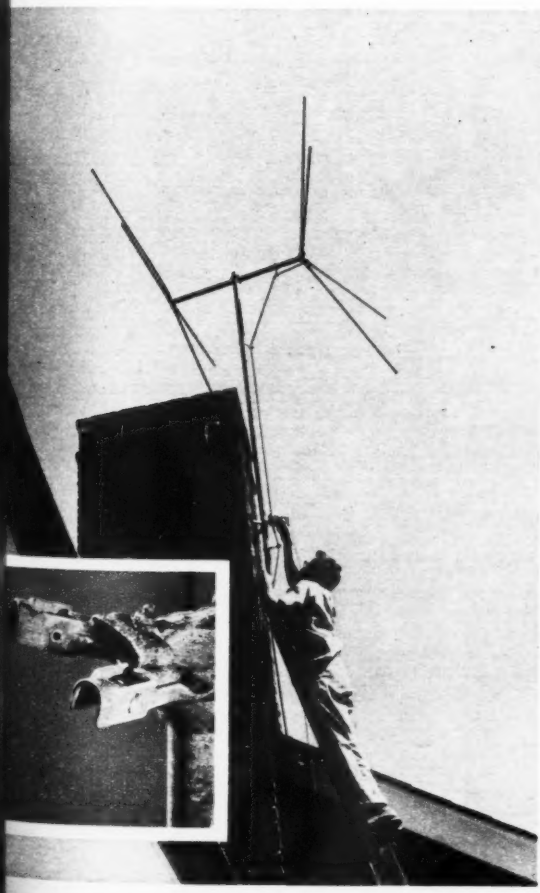


RECOIL STARTER is pulled as youthful driver sits with his left foot depressing brake pedal

THE KART isn't a toy; it's one of the best vehicles for developing driving reflexes.

GET BETTER TV & FM RECEPTION

Best way to improve TV reception is by means of a new antenna; here's how to install one that also helps FM.



FIRST STEP is to remove the old antenna. The inset shows the extensive corrosion present on old mast.

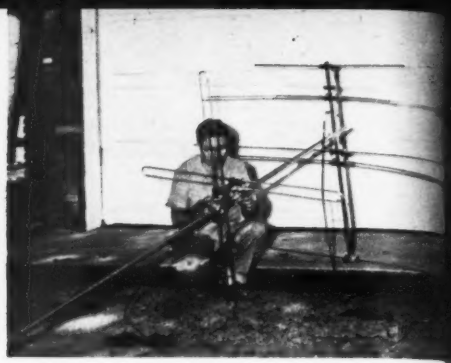
IF YOU have had your TV set for more than three years the chances are that there has been a gradual deterioration of the picture image without your even being aware of it. "Why," you may say, "I've had my set checked and the repairman has made it as sharp as possible." Right! As sharp as possible—with its present TV antenna. Ah! There's the rub as Shakespeare said.

Antennas, like people, get old. We can't do much about *that* but you can give your TV set a new lease on life by buying it a new aerial. Aerials have been greatly improved since the early days of TV. Now they have "directors," "high and low band reflectors," "folded dipoles," "phasing stubs" and other items of similar ilk, all of which are designed to give you a better image when the commercial comes on. In fact, if you are an early TV fan and you still have your first TV antenna, you will be in for a pleasant surprise as to how much a new antenna will improve reception.

An interesting development is a new twin-driven TV antenna and high-gain FM antenna made by Finco*, both of which can be in-

*The Finney Company, 34 West Interstate Street, Bedford, Ohio

DISCARD old supports and use stainless steel chimney straps to hold new antenna.



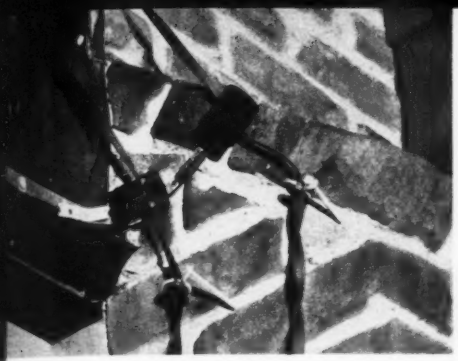
NEXT STEP is to "open" the antenna: it is in kit form, assembled, but knocked down.

CONNECT the separate FM and TV lead-in wires and install antenna in its brackets.

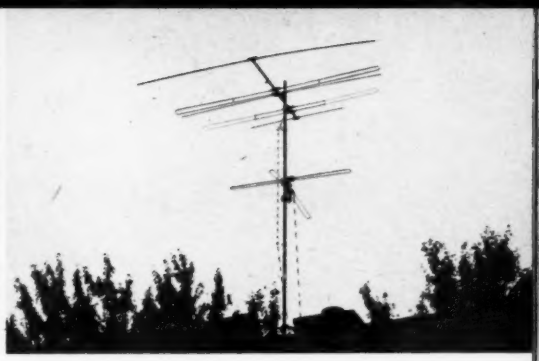
TWIST the lead-in wires; use insulated "stand-offs" where wires touch building.

USE a half-inch drill to make holes for lead-in wires. Keep the wires separate.

THE TWO LEADS are nailed to the floor beams in the cellar with insulated tacks.



IMPORTANT. Use separate lightning arrestor for each lead; connect to the gutter.



THE ERECTED AERIAL. The FM receptor is the cross bar at the bottom of the stack.

stalled on the same mast. If you are the least bit handy with tools, installing this new antenna combination will not present any problem at all. Chief requirement is a good sturdy ladder. However, if you are allergic to a swaying ladder it's best to have a pro do the high altitude work while you limit yourself to snaking the lead-ins down along the side of the building, through the wall, along the cellar beams and up into the floor of the desired viewing and listening area.

ABOVE: Reception with the old aerial and below the improvement with a new aerial.

While both antennas are mounted on the same mast, separate lead-in lines must be used. The antennas should be at least three feet apart with the TV antenna at the top of the mast. Increasing the distance beyond three-and-a-half feet will not improve reception. Both of these antennas, Model B-6 for TV and FMT-A for high-gain FM reception, come in kits complete with hardware and insulators ready for installation. The FMT-A is designed to bring in all stations from 88 to 108 megacycles without rotation. It features two folded dipoles matched with a quarter-wave phasing stub for an all-direction pickup.

The B-6 twin-driven geomatic TV antenna incorporates four coaxial capacitors in one folded dipole designed to operate as if it were one length on the low band and another length on the high band. The flat frequency response of this antenna makes it especially suitable for color.

The installation illustrated in the pictures is quite simple and well worth the effort. The reception is excellent on all TV channels and FM stations. Ghosts on TV have been virtually eliminated.

A word of caution. Don't take unnecessary chances. Be sure to have someone hold the ladder while you are climbing it. Don't reach. Shift the ladder if necessary. Wear sneakers or remove your shoes when working on slate roofs or steeply pitched roofs. Be especially mindful of electric transmission lines. Make sure your TV mast is at a respectful distance from them. •

By John Hugelmeyer

Ice Skate 'ROUND THE YARD

Whether ice artiste or tyro, young or old, a family skating rink provides a wintertime of fun for all.

NEEDLESS to say, the kids will love this skating rink that's a hop, skip and a slide away from their own back door! It can be built in one day for $50 to $100 depending on the size.

On a level section of yard lay out the desired rink dimensions, install 2x6 frames, edgewise, along the perimeter and nail them at the corners as shown.

The rink basin consists of Visqueen, a polyethylene film .006 inches thick that sells for about three cents per square foot. It is available in rolls up to 32 feet in width from the Union Carbide Corp. in Terre Haute, Indiana. Narrower widths of this film can be heat-sealed

POLYETHYLENE is laid over rink area, smoothed, and the edges nailed to the framework.

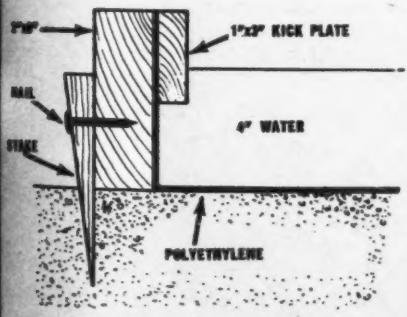
by placing two overlapping ends between a sandwich of kraft paper and pressing with an iron turned up to its hottest point. The kraft paper will keep the film from sticking to the iron or to the surface on which the sealing is done. It can also be joined with plastic tape such as Ger-Pak Miracle Tape.*

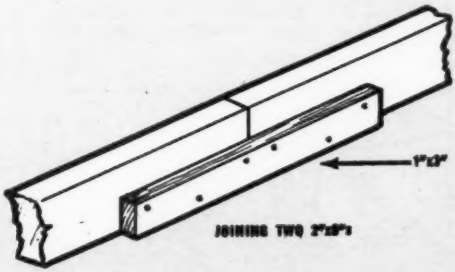
Fasten the polyethylene to either the inside or outside of the frame with galvanized roofing nails. Protect inside installation with a kick plate as shown; if fastened outside, bank a ramp of earth along the frame. Anchor the framing with wedged stakes driven into the ground and nailed at two-foot intervals to the 2x6's.

Finally, protect the polyethylene from puncturing by laying white mineral surface roofing over it.

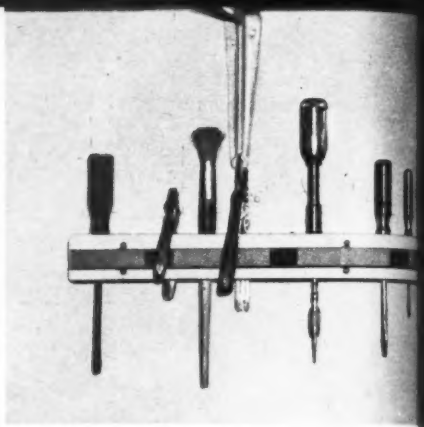
When a mercury dive impends, go out and spray three to four inches of water into the frame. Next a.m. the kids will be up at dawn for figure-eighting. •

*Gering Products, Inc., Kenilworth, N. J.

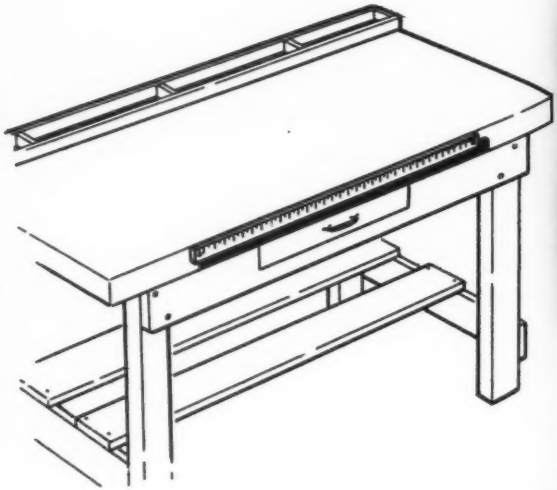




SHOP SHORTS

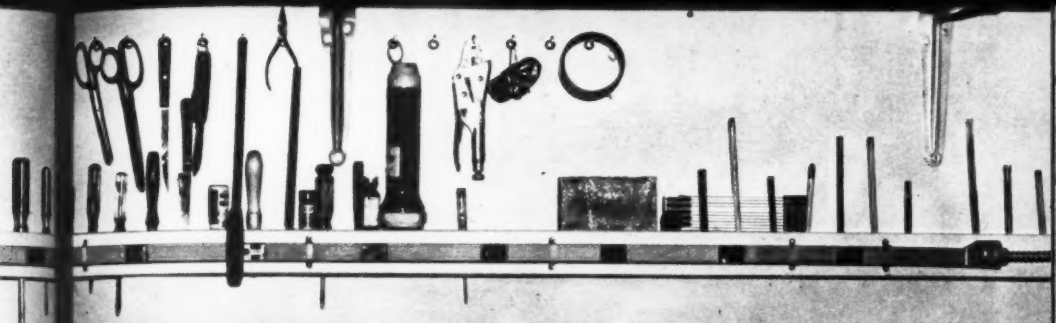


CUT BOTTOM from empty lighter fluid can to make a handy, narrow-necked funnel.

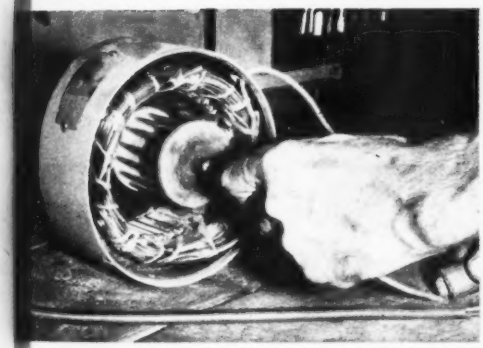


NAIL A YARDSTICK to the front of your workbench to measure bolts, stock, etc., by holding them against the ruler; a big time saver when referring to dimensions.

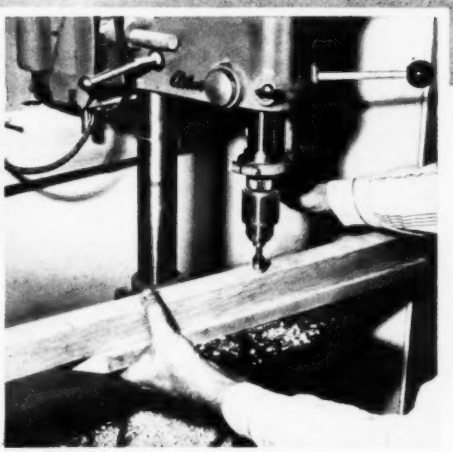
FREDDIE FUMBLES



TWO-BY-TWO supports tools and a facing plug-in strip that offers plenty of outlets.



TEST ROTOR of wire rods, a free-mounted squirrel-cage type, checks rewound motor and the rotor direction before reassembly.



HOLES of varying diameters are drilled through the tool-holding rack and then countersunk for easier insertion of tools.

Send Freddie Fumbles your idea of a good short-cut, time-saver or safety device in your work, whether it be in the home, shop, office or farm. Each tip accepted will be paid for at the rate of $10. Naturally we cannot acknowledge or return the ones we cannot use. However all will be carefully read and evaluated. (Those which we can use in other departments of MI will be paid for at our regular rates.) Please send in your ideas on a postcard only. Address to Freddie Fumbles, *Mechanix Illustrated*, 67 W. 44th St., New York 36, N. Y.

SPRUCE UP YOUR HOME

EXTRA GARAGE DOOR

Convenience and practicality are two good reasons for adding a door to your single-entrance garage.

By Lorna L. Squires

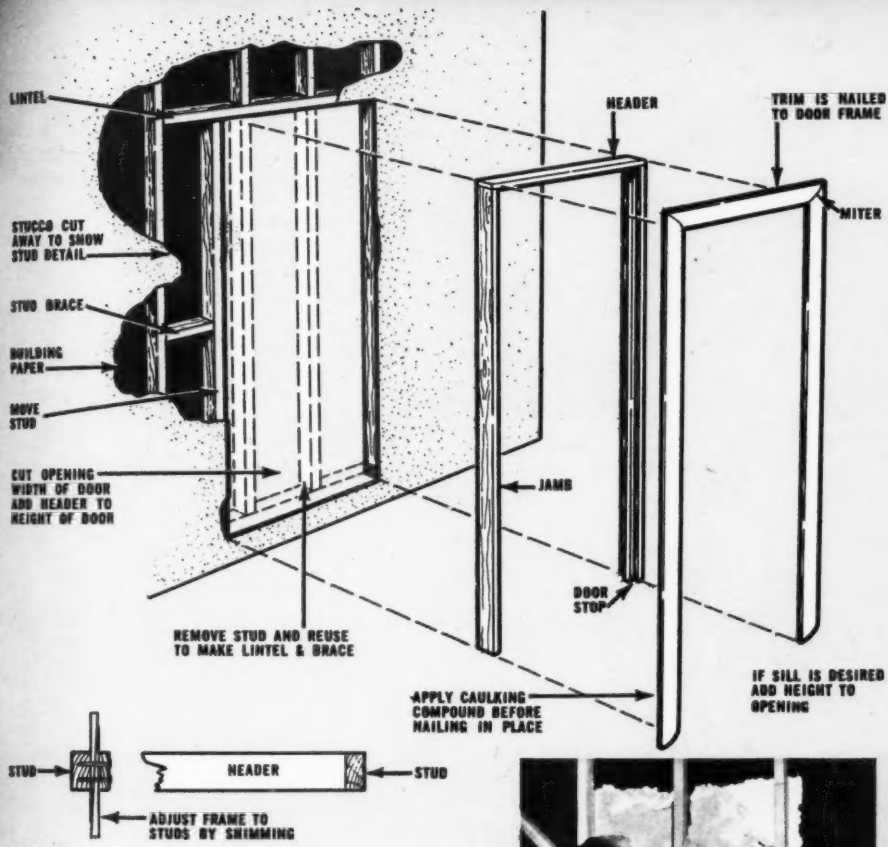
IF YOURS is a one-door garage, you may often have wished for the added convenience of a second, smaller door.

The cost of installing your own windowed door is surprisingly small. In this instance it was further reduced by the utilization of a used door left over from a home modernization project.

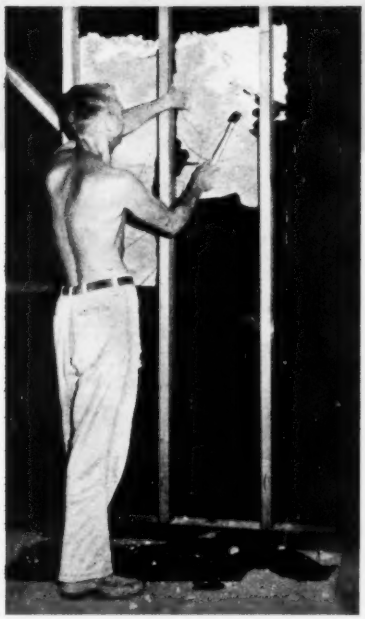
If you have not previously attempted a job like this, your greatest difficulty may be in cutting the necessary opening in the side of the garage. If your garage (like this one) is of stucco, use a portable circular saw with a masonry blade; if a wood garage, use a conventional blade.

First of all, select the materials for the door and frame. Remember, the width of the opening will include the width of the door plus twice the thickness of the jamb stock. Figure the height to include only the door and the header, since no sill is used.

Next, lay out guide lines on the wall according to the dimensions thus determined and cut out the opening with the power saw. If you're sawing through stucco, protect your eyes from any fly-



MASONRY BLADE on power saw carves through stucco wall. (Note: wear goggles for this job.)



USE A HAMMER to knock out door section; work from the top down.

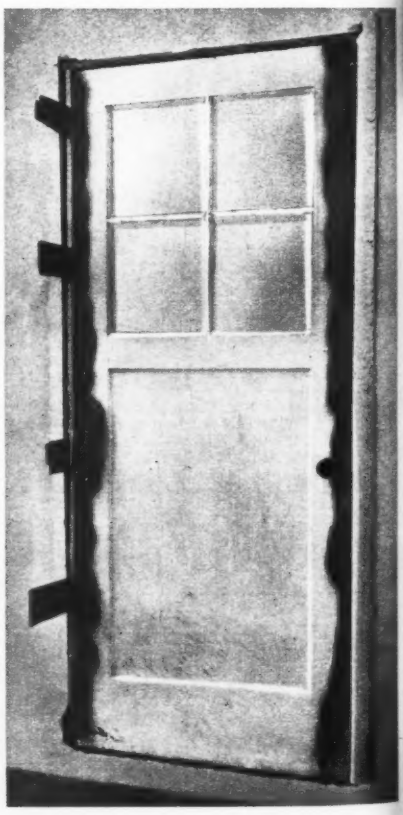
REMOVE STUDS with the power saw. Lengths of these studs will be used later for lintel and side of door.

ing particles by wearing goggles.

With the four sides of the door opening cut, remove the severed section including building paper and wire by knocking it out with a hammer.

The next step is to cut off and remove as many studs as may be necessary—in this case, two. One stud was moved over to the right of the new opening and the other cut to size and used above the door as the lintel. Another short piece of this second stud was re-used as a brace between the two studs to the right of the door. [*Continued on page* 148]

DOOR JAMBS AND HEADER are cut to size and nailed together. The frame is then set into place and adjusted to the studs by . . .

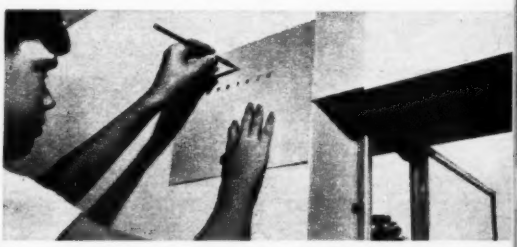


. . . SHIMMING with tapered shingles driven between jamb and stud; temporarily set door in place until a proper fit is made.

Shop Tips

CONCENTRIC HOLES in rods or bolts are easily drilled if you buy a tapered adapter which allows you to install another chuck in the tail stock of your multi-purpose tool.

WHEN SPLICING, strip off more insulation than usual and use the extra wire to facilitate winding. Then snip the wire close, apply solder and wrap with tape, making a neat joint which isn't lumpy.



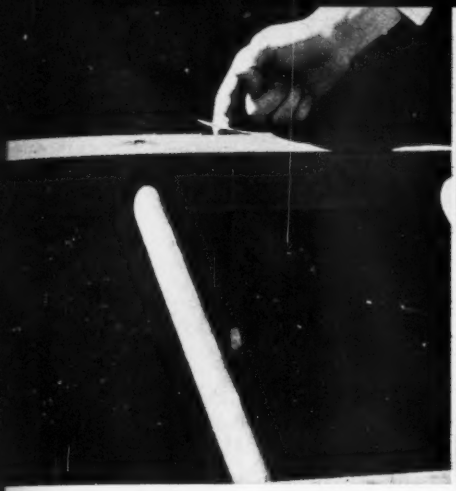
TEMPLATE has holes at various horizontal and vertical distances to speed locating left and right drapery rod brackets.

USE GRAPHITE when installing a new tip in a soldering iron; it will make the tip easy to remove when it has to be replaced.

HOW NOT TO USE A LADDE

WE staged the shot on this page—but, if we'd had our camera cocked at the right places, we could have photographed the real thing thousands of times last year. That saying, "It's as easy as falling off a ladder," didn't just drop out of nowhere.

Actually, there's nothing dangerous about ladders themselves—it's only that they have to associate with people. And people really

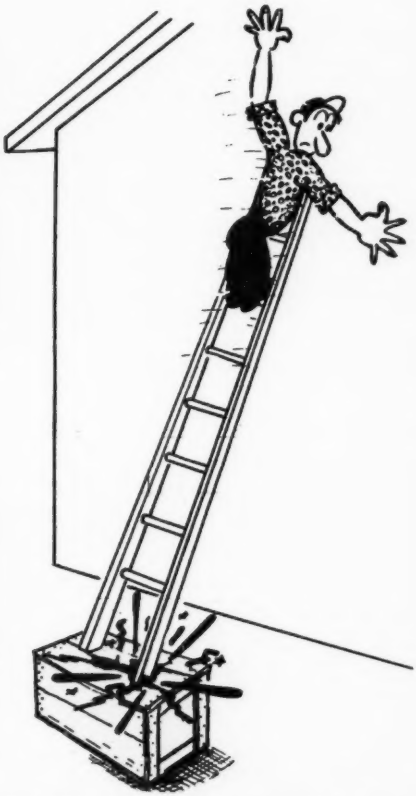


INSPECT ladder before use. Sudden shock of a splinter can send you tumbling down.

TO RAISE A LADDER, place bottom against wall, walk it up and lift the bottom out.

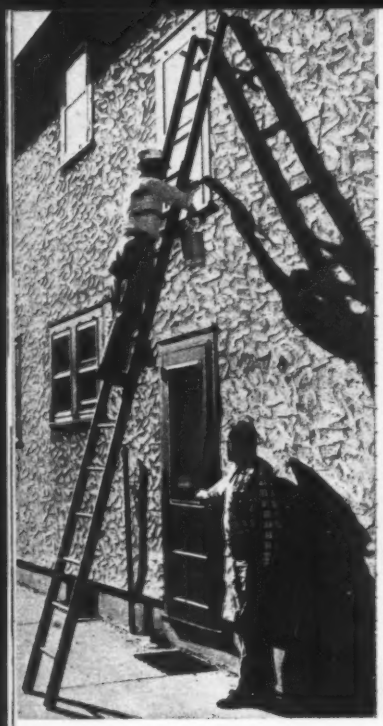
DON'T carry things up by hand: use line to haul them up after you're in position.

ONE QUARTER the length of a ladder is safest distance to set base from the wall.



THIS GUY figured the box would get him a little higher. It made his fall longer.

Drawings courtesy Forest Service, U. S. Dept. of Agriculture



MAKE SURE door won't open if you have to work over it.

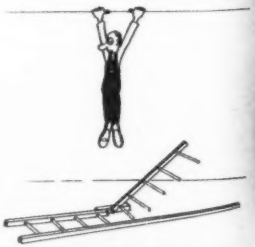
STEADYING hand on ladder can save a climber's neck...

BUT . . . if the helper joins you, watch out!

THIS IS BAD, even for a swan diver. Face the ladder.

outdo themselves when it comes to carelessness and lack of common sense with ladders. Some of the case histories in insurance company files read like comic strips, except that the laugh dies in your throat. Take the character who, while painting the outside of the house, reached the kitchen window. Deciding he should stop for lunch, he had wifey serve the food on the sill—one flight up. It was his last meal, because he leaned back to light a cigar when it was over. Too absurd to happen to you? Don't be too sure. You've undoubtedly pulled many of the common and equally dangerous boners. How many times have you climbed a ladder with

EYES RIGHT—not left.

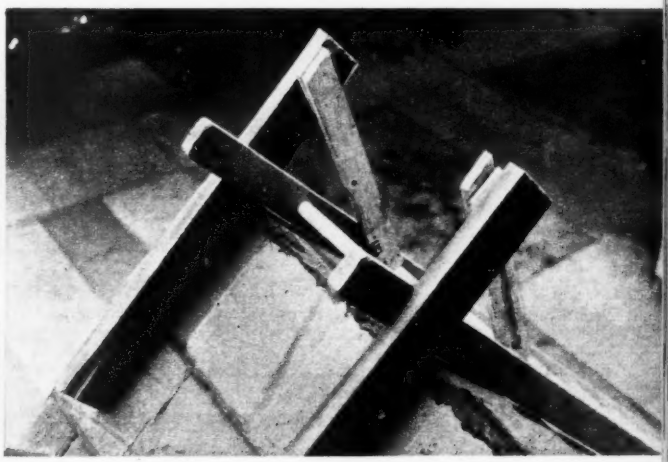


SPLICES? For the birds.

DRIVE STAKE into ground and use rope to secure ladder which rests on a slippery surface.

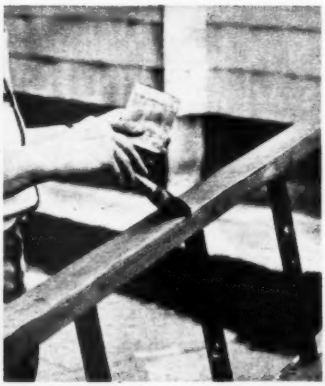
SOLID FOOTING on uneven ground is achieved by using base such as this.

ANOTHER means of leveling. Clamps go on opposite sides.



WORK ON A PITCHED ROOF is made safe by using four cleats to anchor a ladder as shown in this photograph.

ANGLE SUPPORT takes weight off a roof edge.



TREAT ladder with linseed oil at least once each year.

HE WHO goes to the top...

USE BOTH HANDS to grasp ladder for climbing.

A SAFE WAY to work. Do not lean out to the side.

SNEAKERS or rubber-soled shoes are correct footgear.

one hand? Or leaned over the side to reach just a little bit farther? Foolishness, pure and simple.

The private home owner tops the ladder accident list. He feels snug and safe in the familiar surroundings of his property. But when he takes this false sense of security up a ladder, he stands high as a probable statistic. Some of the things he does and *should do* are illustrated on these pages. Look them over and get into the safety habit. It won't kill you. •

NOW who left that there!

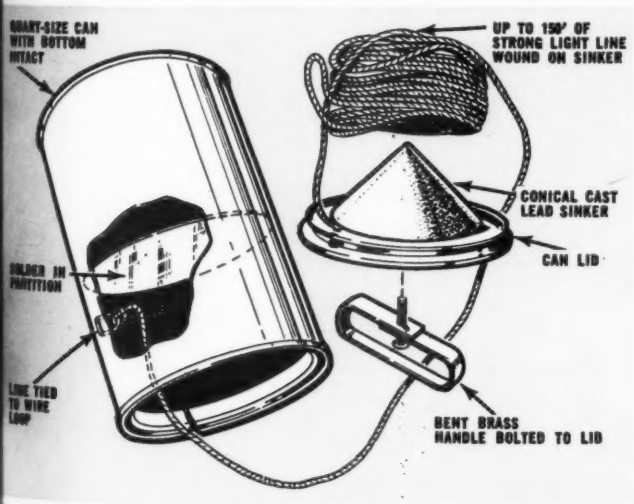
WATCH this bit of irony.

LUNCHING on the ladder is a common cause of accident.

Marker Buoy

"X marks the spot"—but not on water, so let this marker buoy be your guide.

IF you've ever lost $100 worth of equipment overboard (as I have), you won't have to be sold on the importance of carrying a marker buoy in your boat. This self-contained type can be made in jig time for two or three dollars.



Use any metal can of about quart capacity, provided it has a push-on or push-in lid. Solder the tin partition in place and secure the wire ring (for the line) inside the open half of the can. Cast the snagproof, conical sinker from lead and bolt it to the brass-handled lid. Then paint the can a bright yellow.

To use, snatch off the lid and throw the whole thing overboard. Out reels the line and up bobs the marker buoy—right where you want it.

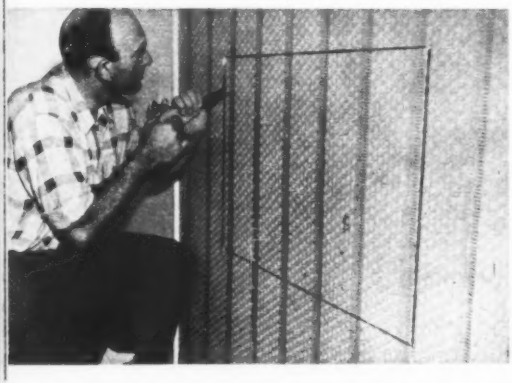
—*W. D. Needham*

BUILT-IN BAR

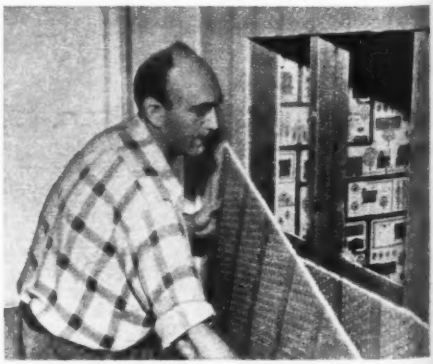
Bar problems disappear with this disappearing bar.

NO special tools or woodworking skills are required to construct this decorative space-saving unit, although power tools will speed the work and insure accuracy. Size of the bar will be determined by available wall space, so the dimensions shown can be altered as required.

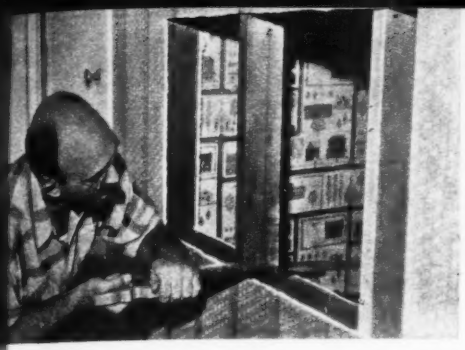
Before you cut into any wall, check that no plumbing or power lines or main supporting members run through the section. If possible, build the bar into a closet or stair well. The unit illustrated here is recessed just above a basement stair well.



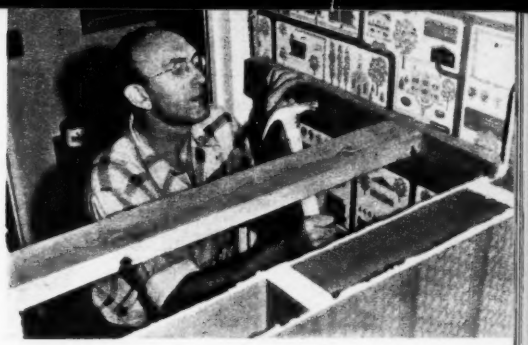
MARK OFF bar area on wallboard and remove section with compass or keyhole saw.



REMOVAL of wallboard exposes noncritical wall studs which can be safely cut away.



CAREFULLY cut studs flush with edges of the wallboard to simplify the framing job.



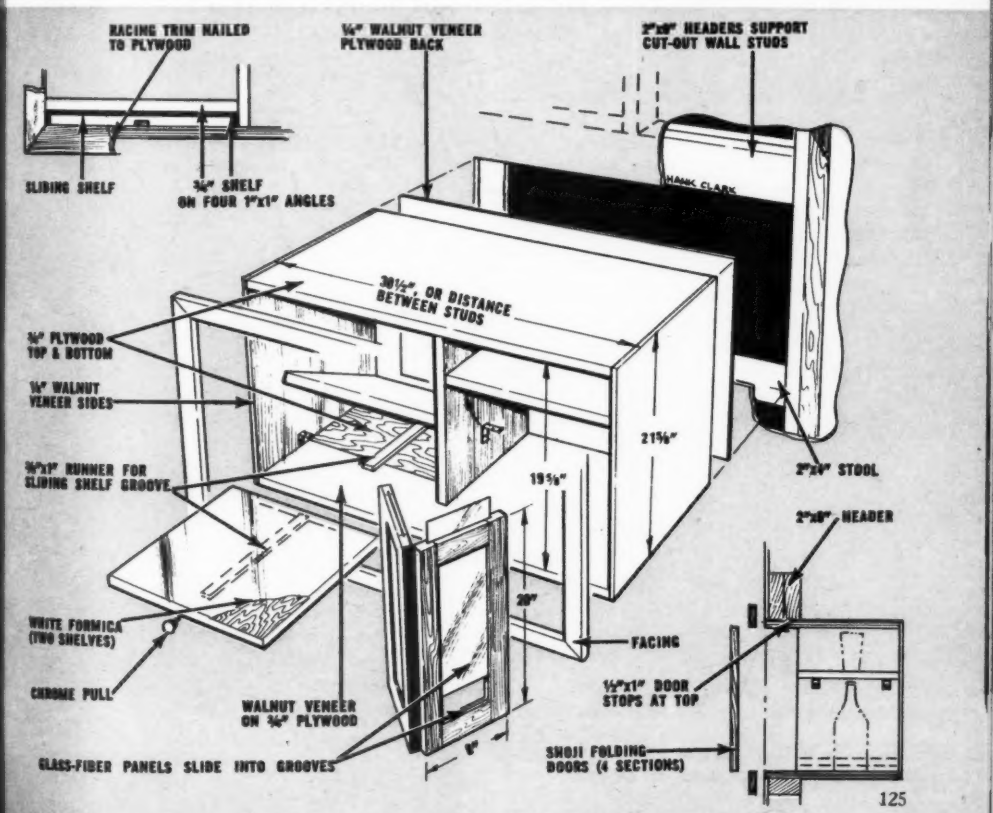
FRAMING of 2x4's should be checked out with spirit level before nailing it down.

To begin, mark off the bar area on the wall and cut out the section with a compass saw.

This bar measures 30½ inches wide, 21⅝ inches high and 18½ inches deep. Walnut veneer is recommended for all exposed surfaces—quarter-inch for the sides, bottom and top and ¾-inch for the stationary shelf. The center divider is of one-inch stock.

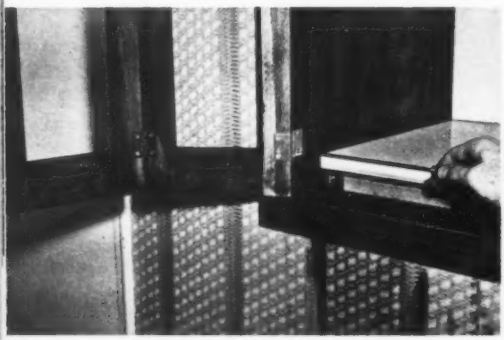
The supporting platform consists of 2x4's cut to fit and then nailed into wall studs on both sides. The lengthwise 2x4's are press-fitted and nailed in place.

With the 2x4 framing completed, the



PLYWOOD BASE is nailed to the framing with its edge flush with the outside wall.

NOTCHED divider panel is fitted into place under 2x6 wall beam which it helps support.

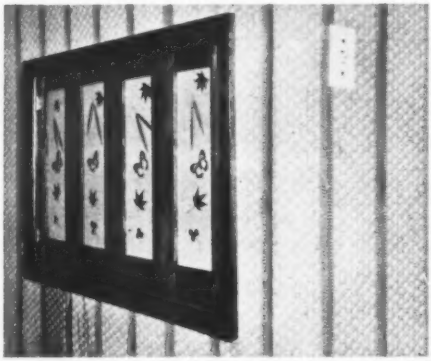


SHOJI folding doors are prefinished, then installed at either side of the bar cabinet.

GLASS-FIBER PANELS of Shoji doors are fitted into place through slots in the top.

¾-inch fir plywood base is cut to size and secured flush with the outside wall with finishing nails and glue.

The front upper corner of the divider panel is rabbeted to fit snugly under one of the 2x6 wall [*Continued on page* 141]



LIGHTED MURAL effect is achieved with an interior bar light glowing through doors.

SLIDING SHELF provides ample serving area when the bar is in use.

FRESH PAINT TIPS

RUST-OLEUM is a fish-oil-vehicle paint which protects metal surfaces from rust. It is available in 14 colors.

RUBBER-CEMENT aluminum-foil pie pans to paint can bottoms to catch paint drips.

A handy manual, Latest And Best Methods In Refinishing, is available for 25c from the Wilson-Imperial Co., 115 Chestnut St., Newark 5, N. J. . . . Brushes with plastic handles which are not affected by paint and lacquer solvents are made by the H. V. Hardman Co., 571 Cortlandt St., Belleville 9, N. J. They are called Tufilte Hardman-Hollo-Handle. . . . The Adams Brush Co., 130 Prince St., New York City, is marketing a Tynex nylon brush whose flagged and tipped bristles add to the paint capacity of the brush. . . . A paint brush shield which prevents paint from running down the handle when painting overhead is available from the Whiz No-Drip Co., 122 W. Walnut St., Blytheville, Ark. The Minnesota Mining and Mfg. Co., 900 Bush Ave., St. Paul 6, Minn., gives a similar shield with each 98c roll of Scotch masking tape.

PLIOFILM DISKS cut from food wrappers seal paint cans, provide see-through lids.

WIRE MESH platform in bottom of turp can keeps brush bristles free of sediment.

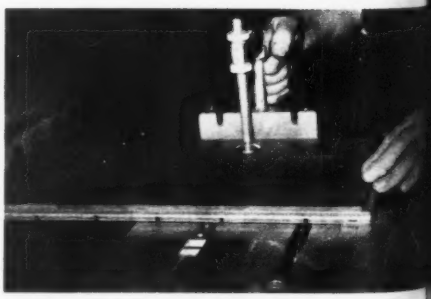
MI EDITOR Bill Parker checks a number from a directory taken from his own cabinet.

TELEPHONE BOOK CABINET

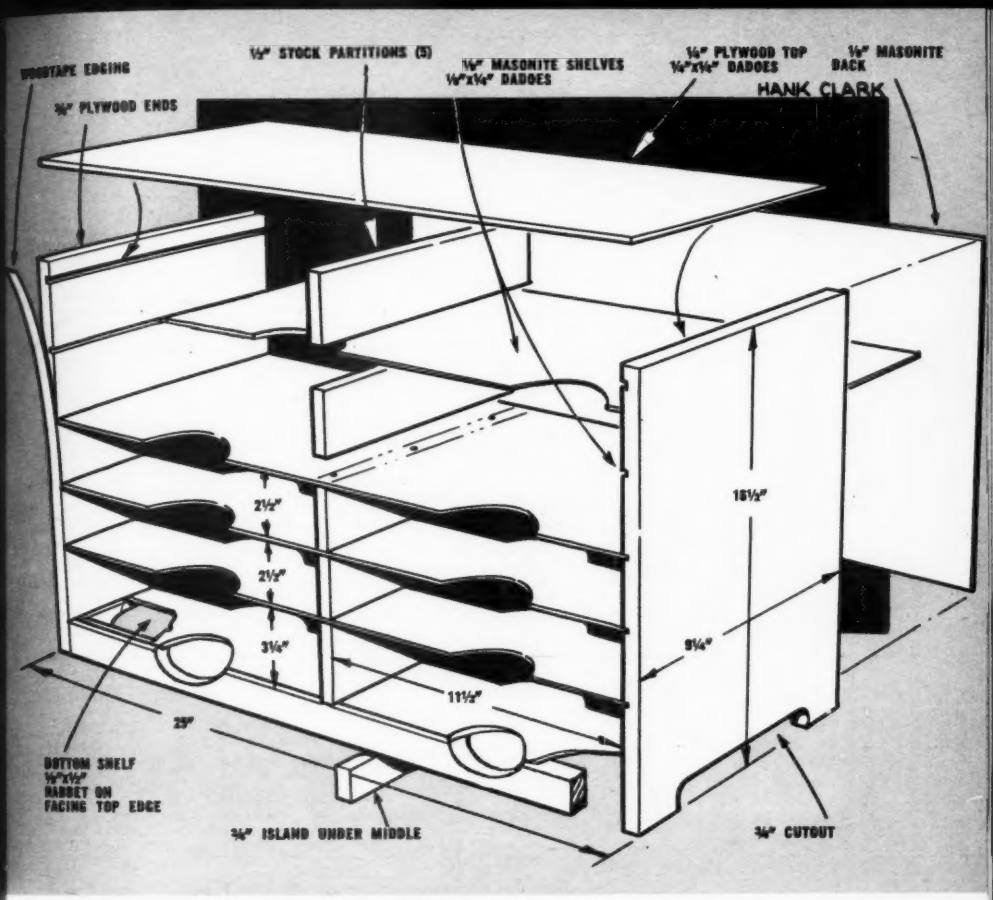
THIS multi-shelved rack was designed to hold telephone books but it can be used just as handily for items such as catalogs, magazines, or even recordings by altering the dimensions.

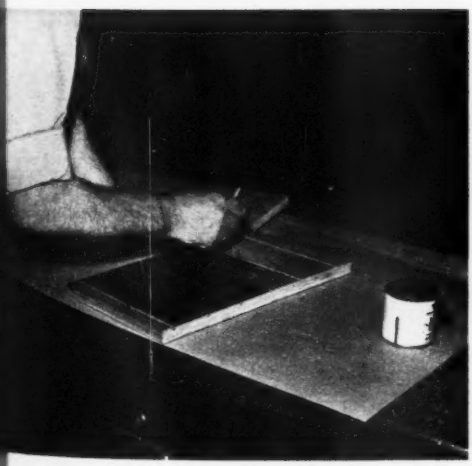
Cut all stock to size, then dado the ends to fit the shelves. Rabbet the back edge of each end piece ⅛-inch deep by $\frac{11}{16}$-inch wide to take the Masonite back.

Cut out a ¾x5½-inch area at the bottom of each end piece so that two two-inch legs remain. Paint the inside of the top and end pieces brown to blend in with the walnut. Now cut out the arcs in the shelves and [*Continued on page* 140]

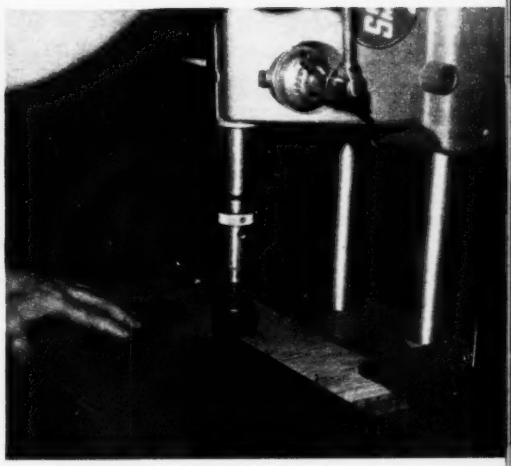


DADOES for the Masonite shelves are cut into the end pieces with a circular saw.





INNER SIDES of end pieces and top piece are painted brown to blend in with walnut.



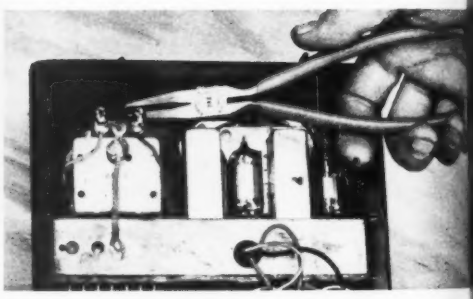
HOLE SAW in drill press chuck is used to cut out the arcs for the finger grips.

MI's HARDWARE STORE

Midget rubber stamp with your name, address and telephone number is $1.00, ppd., from Edes and Co., 114 N. 13th St., Philadelphia 7, Pa. . . . Protex-A-Hand, made by Acrolite Products, Inc., West Orange, N. J., comes in spray can, keeps grease, paint, etc., from sticking to hands, later washes off with water. . . . Weld is sold in three forms: porcelain, steel or glass. It has epoxy resin base, mends just about anything. Made by Weld, 460 Union St., Lynn, Mass., it's 59 cents a tube. . . . New hangers for perforated board lock in two holes, won't shift. They're product of Turnbuckles, Inc., Box 333, Michigan City, Ind. . . . Candles in various colors and 6-, 12- and 18-inch lengths withstand temperatures up to 110°F without bending. Write Candles of the Month Club, Box 6552, Houston, Tex. . . . Snapit TV Tube Guard eliminates initial high-impact surge which shortens tube life. $1.00 to Cable Electric Prod., 234 Daboll St., Providence 7, R. I.

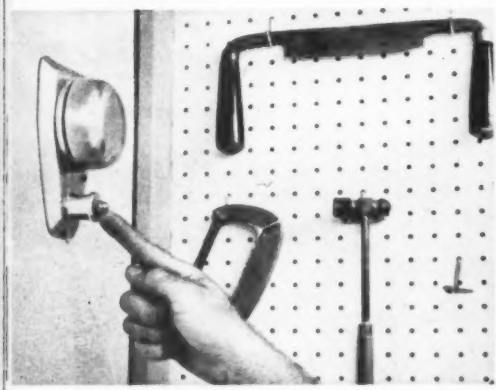
FOAM-TITE casement weatherstrip is sold with special adhesive; 12- to 14-sash kit: $10.

Casement Weatherproofing Co., 120-86 Queens Blvd., Kew Gardens 15, N. Y.



ELECTRONICS PLIERS have long jaws, plastic-coated grips; end cutters cost $3.40.

Champion DeArment Tool Co., Meadville, Pa.

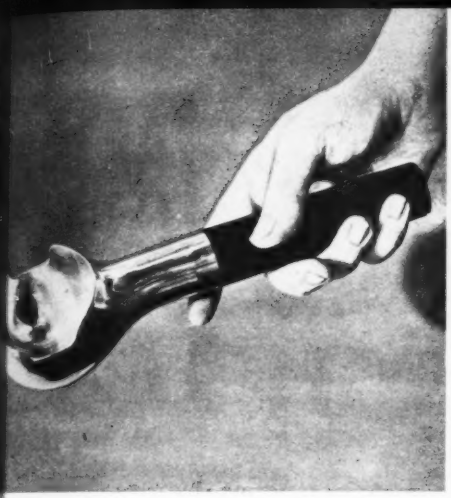


FIRE ALARM requires no electricity; wind bell and thermostat trips it at 130°F; $9.95.

Crusader Sales, Box 1191, Bristol, Conn.

LOG CARRIER is made of heavy-duty duck, has two web supporting straps; $4.00, ppd.

Schenke, Inc., 73 S. Lexington Ave., White Plains, N. Y.

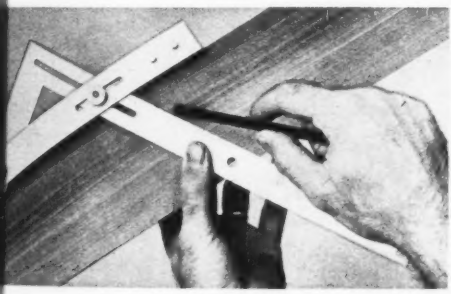


SCOOP has heat-retaining liquid in aluminum head so ice cream won't freeze to it.

Modern Machine and Tool Co., Inc., Staatsburg, N. Y.

ROUND SURFORM tool shapes and enlarges wood, aluminum, etc. Cost is $2.29.

Stanley Tools, 111 Elm St., New Britain, Conn.

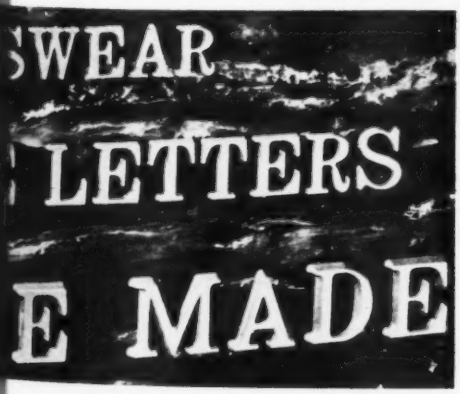


SQUANGLE serves as square, adjusts from 45° to 90°, decides rafter length, cut: $6.95.

Squangle Corp., 6306 176th St. S.W., Lynnwood, Mass.

COUPLER hooks two TV or FM sets to single TV antenna. Standard, $2.50; fringe, $3.50.

Walsco Electronics Mfg. Co., 100 W. Green St., Rockford, Ill.



SELF-ADHERING plastic letters are 2 in. high. In bronze or white, 30c each, ppd.

A. Lawrence Karp, Saw Mill Road, Stamford, Conn.

PARTS CLEANER, a blend of solvents, comes in 1½-gal. container with a parts basket.

Permatex Co., Inc., 300 Broadway, Huntington Sta., N. Y.

AMMETER AND VOLTMETER are mounted in chrome-plated panel installed as shown.

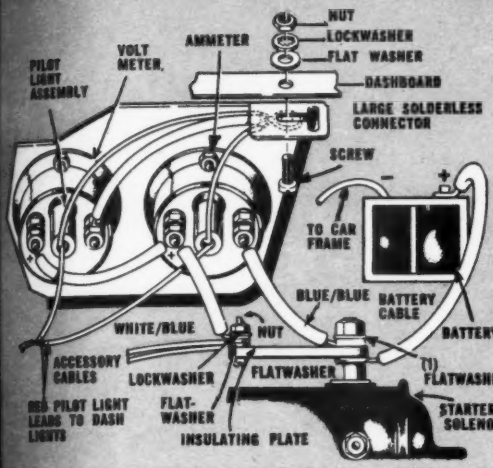
DETROIT: HOW TO INSTALL AN AMMETER

Keep tabs on the electrical system of your car by installing an ammeter and a voltmeter on the dash.

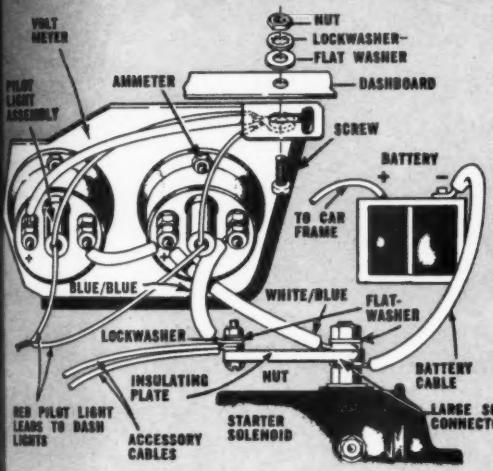
KNOWING at all times how your car's electrical system is operating enables you to avoid a variety of troubles. But the red "idiot light" in today's cars doesn't give you a constant check—it lights up only when the generator voltage is *less* than that of the battery's.

The key to proper operation of the electrical system is the voltage regulator and its action should be checked periodically. By knowing the current entering or leaving the battery, and the voltage at the battery, you can determine when adjustment is needed. This is possible with a kit made by Allied Radio Corp., 100 N. Western Ave.,

KIT includes meters, panel, pilot lights, wires, insulating plate and the connectors.



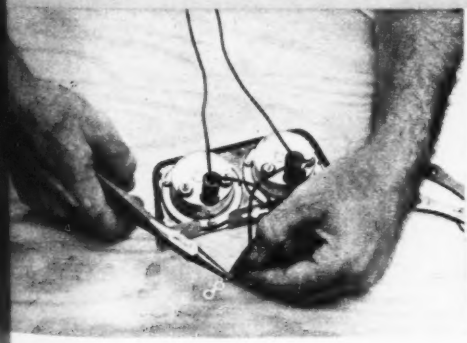
MOUNTING AND WIRING VIEW FOR A SYSTEM WITH A NEGATIVE GROUND



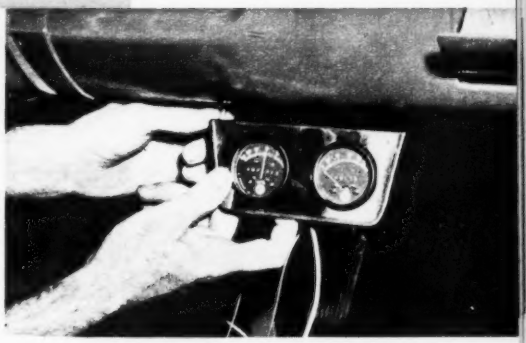
MOUNTING AND WIRING VIEW FOR A SYSTEM WITH A POSITIVE GROUND

Chicago 80, Ill. The Knight-Kit contains an ammeter and a voltmeter for installation in a 12-volt system. It sells for $10.

The ammeter shows the current going into or leaving the battery. With everything off, it reads zero. With the engine off and accessories on, it shows a negative (—) discharge. With the engine idling, it may still show a discharge because the generator is not producing as much current as the accessories are using. Under normal driving conditions, it shows a charge of about five amperes on the positive (+) side. The charge may be as high as 30 amperes for a short time if the battery is run down (for example, right after starting the car). As the charge builds up, the current decreases and the voltage increases. Continued high charging may indicate a grounded generator [*Continued on page* 151]



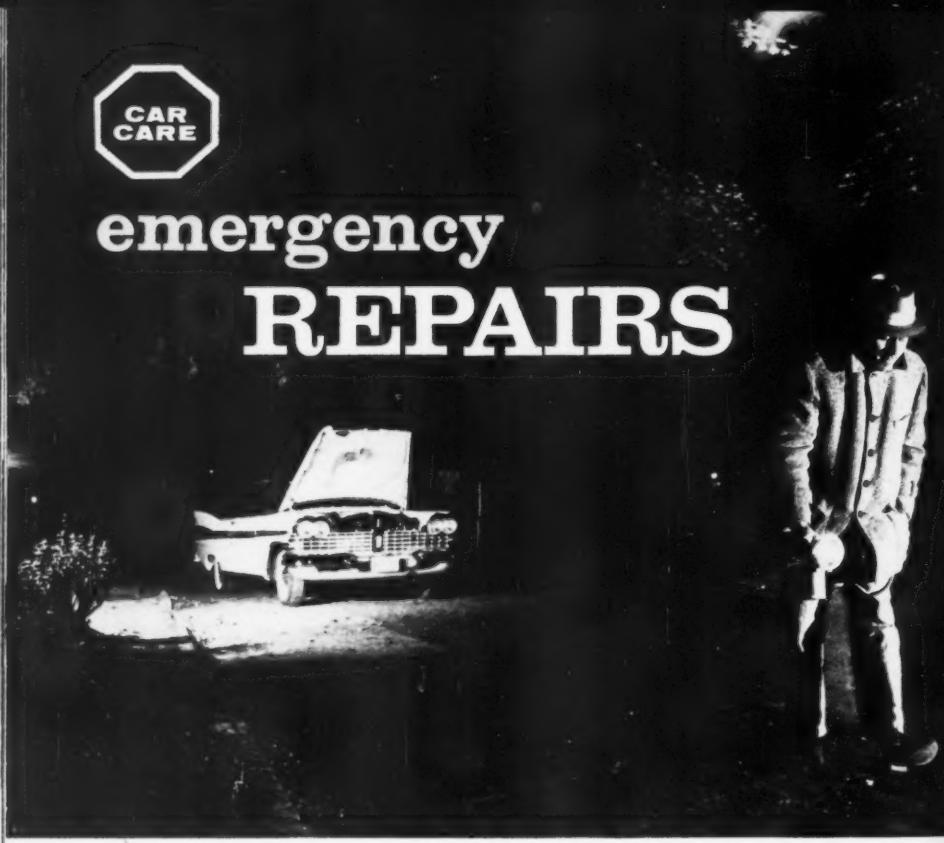
NO SOLDERING is needed since connectors are type which are crimped onto the wires.



PANEL has universal mounting holes for bolting through existing holes under dash.

CAR CARE

emergency REPAIRS



It often happens that there's a simple remedy for the trouble that "strands" you miles from nowhere.

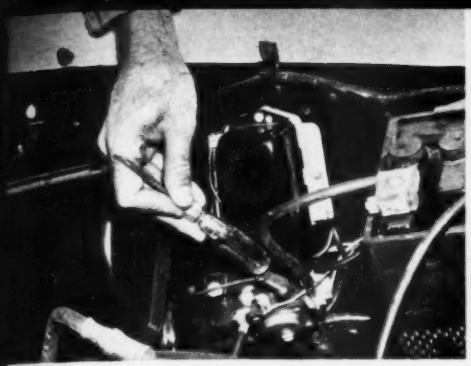
By Frederick C. Russell
Member, Society of Automotive Engineers

MORE than 60 million SOS calls will be made by stranded car owners this year. But *you* need not be one of those who are "at sea" when a breakdown occurs if you have a reasonable idea where the target is when you're trouble shooting.

Owners have employed some novel ideas to solve their breakdown problems. There was the fellow whose engine quit because the distributor's breaker arm spring broke. Reaching into his pocket he produced a rubber band which he used to provide temporary spring action by slipping one end over the arm and the other over the primary terminal outside the cap. Replacing the cap he started up the engine, then drove the three miles to a garage.

While not every mechanical failure lends itself to emergency treatment, many difficulties *can* be overcome by "making the best of a bad situation." For example, I was once forced to drive 25 miles without being able to disengage my clutch. Every stop stalled the engine and all starts had to be made in the jammed gear position—in this case, Second. The point is, I did manage to make it to a garage.

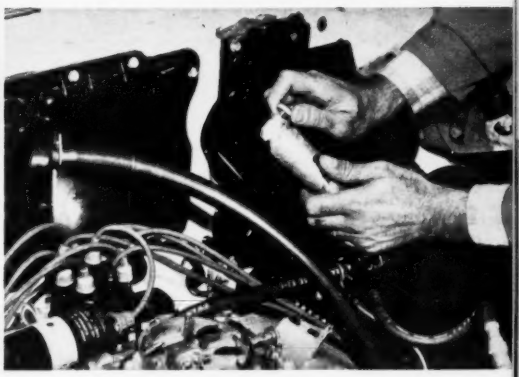
Nor should you lie down and die when an automatic transmission starts slipping excessively. There's a good chance



HORN STUCK? First try tapping the cover of the relay box to separate the points.

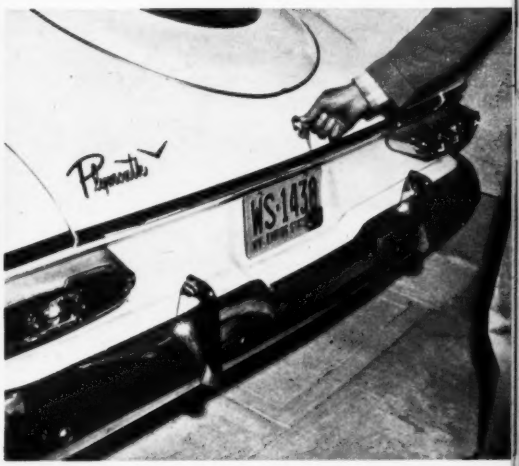
CHOKE FAILING? Block off carburetor air intake while someone operates the starter.

VACUUM may suck in a softened radiator hose, block coolant; drive below 30 mph.



WET IGNITION is dried by spraying with a carbon tetrachloride fire extinguisher.

REAR WHEEL spinning on ice or snow may be checked by applying hand brake lightly.

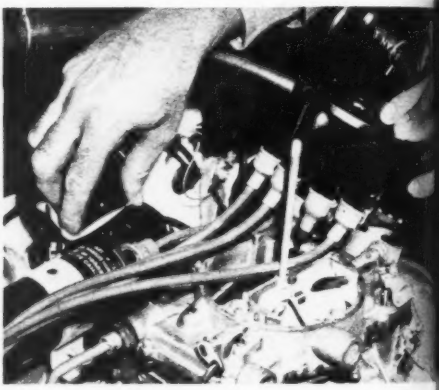


FROZEN LOCK on trunk will yield if you heat key with match or cigarette lighter.

CAN of additive often keeps valves from sticking, prevents overheating on hot day.

TIRE TAPE is the answer when a radiator hose springs a leak that would strand you.

WATER from engine block can be drained through radiator by parking car on a hill.



RUBBER BAND will replace a broken distributor arm spring, get you to a garage.

BUCKET OF SAND kept in the trunk will prove useful when there's ice on the road.

SPARE raises car if jack can't fit bumper; also gives more "working room" below.

you'll be able to make it to a garage if you wait for the unit to cool off.

If vacuum begins to pinch shut a softened lower radiator hose, thus blocking the coolant flow, lower your road speed to 30 mph or less. Reducing speed drops the engine temperature and is a good gimmick to remember when you're plagued with overheating due to a clogged radiator.

A friend of mine merits a prize for a remarkable bit of success when faced

JUMPER WIRE is a handy thing to have for starting if you lose the ignition key.

with a fuel pump that came loose and quit. You might say he finally got home on a wing and a prayer because, in addition to being a car buff, he's also a minister. Not only did he lack the tools to do the necessary mechanical work on the pump, but one of the two nuts holding the pump to the engine had been lost. What to do?

On lifting the lid of the luggage compartment he noticed the wooden wedge which, until recently, Cadillac supplied to customers for use in blocking one of the wheels when jacking the car to change a tire. Using this wedge to jam the fuel pump back into position, he was able to drive the rest of the way home without further trouble.

Don't panic at the first sign of a malfunction. A [*Continued on next page*]

SERVICE TIPS

from Detroit

A flickering fuel gauge or temperature gauge panel lamp on a '59 DeSoto may be due to an intermittent ground connection between light socket and instrument panel. The trouble may be corrected by soldering one end of a wire to the socket of the affected lamp and clamping a spade-type connector to the other end. Attach the spade under a dash panel screw to obtain a good ground.

The radiant band (dark area) along the top of Ford windshields fades slightly under sunlight. Keep this area free of stickers or labels so that the tinted glass will maintain a uniform hue.

Damaged '59 Eldorado Brougham plastic hood release handles can be replaced with a 1948-49 Cadillac all-metal hood release handle and cable assembly after shortening the cable to fit. This assembly, Part No. 1455430, is also more durable.

Excessive accelerator pedal effort on 1960 Studebakers can be corrected by removing the pedal from the push rod and floor pan and grinding away a portion of the rubber at the "heel" of the pedal.

MoPar Division of Chrysler Motors now manufactures Rocker Repair Panels which fit all 1949-59 Chrysler Corp. cars and many other makes as well. These easy-to-install panels are made of heavy-gauge steel and are contoured to slip over a rusted or damaged body side sill.

Studebaker recommends that engine oil be used to lubricate the cartridge-to-base plate rubber gasket of their sealed can-type filters in order to prevent oil leakage.

[*Continued from preceding page*]

little patience often pays off. Recently I left my car parked on the street and—foolishly—failed to lock it. Returning to it later in the day I was surprised to find that the electric window lifts would not work. A weak battery was immediately ruled out when the engine started normally and the lights were bright as usual. Then I noticed that someone—perhaps a couple of neighborhood kids—had been fooling with the radio's push buttons. Each of the window motors is equipped with a circuit breaker that prevents overloading and damaging the motors if the windows are used excessively; twenty minutes later all the windows were operative again.

Waiting will often result in a battery recovering enough to crank the engine, especially under conditions of rising temperature. One motorist's engine suddenly broke into a terriffic valve clatter. Investigating, he found the engine's oil supply quite low; what oil remained was too hot and thus too thin. So he waited half-hour for the engine to cool off, then drove five miles to a garage without so much as a tap from the tappets.

If an engine with good spark and a lively battery won't start there's a good chance that the choke isn't working properly. Take off the air cleaner and hold a flat block of wood over the carburetor's air intake while someone operates the starter. This chokes the engine and will often provide the needed start. You can do the job without an assistant by tying a string to the block: just yank the block away as soon as the engine starts.

When another motorist couldn't re-start his car following a stall, the service man who came to his rescue merely tapped the fuel intake area of the carburetor lightly with a wrench. Almost immediately the engine went into action. Stalling and failure to re-start had been caused by a speck of dirt that prevented the carburetor's needle valve from seating. A light jolt in the right area turned the trick by preventing the flooding action which, in turn, had caused both stalling and failure to restart.

In some cases of car trouble you need to be quick on the trigger rather than philosophical and patient. For example, if both dashboard warning lights (oil pressure and battery charge) start flickering while the engine is idling it's a sign of an impending stall. Gun the engine immediately in order to get more fuel flowing through the needle valve. Similarly, if the brakes don't hold when you first press down the pedal, start pumping immediately to build up a low fluid reserve and eliminate any air in the system.

One resourceful motorist found himself harassed by a set of brakes that built up pressure and applied *themselves* until the car came to a halt. Cause was a clogged hole in the filler cap of the master cylinder; the cure called for bleeding the lines—but our friend didn't have a bleeder hose. So he removed the hose from the tire pump in his trunk; removed the bleeder screw and loosened the bleeder valve; connected the rubber end of the hose to one of the front wheel bleeder fittings; and pinched the hose together with a spring-type clothespin (which he happily happened to have!). Then when he pressed the brake pedal the pressure forced the clothespin open and allowed the fluid to escape; but when he removed his foot from the pedal the pin closed and kept air from being sucked into the system. How's that for ingenuity in an emergency!

On a trip last summer I began to worry about my car's lack of power on hills and guessed that it was carburetor trouble. Sure enough, lifting the hood revealed the exhaust manifold heat control valve stuck in the closed position. Penetrating oil for the valve's shaft would have been the best remedy, but I had none. Then I recalled that it sometimes helps to tap the end of the shaft, which I did with the end of a wrench. Almost immediately the valve snapped open. By working it back and forth a number of times I got it free enough to obtain normal action for the rest of the day's driving.

Yes, you can avoid the need for hollering "Help" at the first stall if you make it a point to know at least enough about your car that you have a fighting chance of being able to get going under your own steam whenever trouble strikes. •

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Carbon-X 77 works wonders. It is the *complete* fuel system conditioner—keeps your carburetor, fuel lines, fuel pump and tank free from gum deposits. What's more, it eliminates carburetor icing and keeps the gas lines ice-free. Why take chances when it's so easy to be safe? Next time you get gas, ask for Carbon-X 77. Keep carbon, gum and sludge from fouling up the fuel system. Easy does it with Carbon-X 77.

If quality service is your business, ask your nearby UMS distributor about the service-minded Rochester-GM line of factory-recommended performance items. ***Rochester Products Div. of General Motors, Rochester, N. Y.***

Rochester-GM Carburetor specialists have scientific Kleanout kits on hand that enable them to give you a quick on-the-car carburetor clean-out, or an off-the-car carburetor clean-out with Off Kar kits. Each has factory-recommended components to do a thoroughly satisfactory job for you. Should your carburetor need overhaul, these same specialists have just the answer; Rochester-GM Carburetor Master kits. All the right parts for a top-quality job insure your getting your carburetor back into the new car condition you want.

Need a New Carburetor? If you do you'll be money ahead getting a brand new original equipment Rochester-GM Carburetor. These new units contain the newest carburetor advances to up-date your performance and mileage. Check the new low price for a new Rochester-GM Carburetor, America's number one original equipment carburetor!

Hear About Carb-AIRator? Many a motorist has—and every user has become enthusiastic because Carb-AIRator—a hot idle compensator that fits all cars, cures stalling and rough idle due to excessive under-hood heat. This can be mighty annoying and Carb-AIRator, quickly and easily installed, can end it for you. Get rid of rough idle, stalling and hard starting due to under-hood heat. Get Carb-AIRator. It's that simple!

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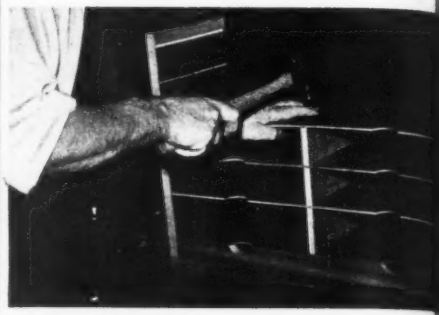
Telephone Book Cabinet

[*Continued from page* 128]



PARTITIONS are secured by face-nailing through the shelves and the Masonite back.

front base that will serve as finger grips. Conceal the end grain of the plywood and other exposed stock with a veneer.

Assemble the unit using glue and brads and apply flexible Wood-Trim edge veneer where required. Complete the job by securing the island piece in place where shown. Sand the cabinet smooth and finish with two coats of Satinlac.

—*Clarence Martin*

PARTS LIST

Top	Walnut-faced plywood	1/4"x9 1/8"x24"
Front base	Walnut-faced plywood	3/4"x1 1/2"x23 1/8"
Sides	Walnut-faced plywood	3/4"x9 1/8"x18 1/8"
Back	Masonite	1/8"x15 1/2"x24 1/8"
4 Partitions	Walnut-faced stock	1/2"x2 1/2"x9"
1 Partition	Walnut-faced stock	1/2"x3 1/4"x9"
5 Shelves	Masonite	1/8"x9"x24"
Island piece	Stock	3/4"x1 1/2"x8"
Walnut edging		1 3/8"x96"

COMPLETED CABINET'S ten compartments can hold telephone books, magazines or records.

Built-In Bar

[*Continued from page* 126]

beams for added support. Fit it in place with blocks glued in position out of sight at the top and with screws coming up through the platform.

In this case furring strips were needed on both sides of the bar because the inside walls of the stair well were slightly recessed. The strips were measured to fit flush with the exposed 2x4's. The panels for the right and left sides were then glued over both the furring strips and 2x4's and fitted flush with the outside edges. Applying the upper walnut strip completed the assembly.

The ¾-inch plywood sliding tray is dadoed on the underside to fit into a slider anchored to the platform. The top and three exposed sides are covered with walnut Formica after contact-bonding the front and side pieces.

The bottle shelf is directly above the sliding tray and is made from ¾-inch plywood and covered, front-edge and top, with white Formica. It rests on four small L-brackets placed just high enough to permit clearance for the sliding tray. The shelf for the glasses is of ¾-inch walnut veneer and also rests on four steel brackets.

The outside 1½-inch walnut molding is corner-mitered to fit, then prefinished before assembly to prevent soiling the wallpaper. Brads are nail-set and the holes filled in with walnut-colored plastic wood.

Shoji folding doors can be purchased ready-made. Their glass-fiber panels are removed through slots in the top during wood finishing and then replaced.

To finish, the wood is fine-sanded, then given a coat of wood filler. Finally, two coats of polish followed by two coats of wax—and your gleaming refreshment cabinet is complete.—*Scott Saunders*

FUTURA

Scaled after the famous Lincoln Futura, this model has an electric motor, lights, indicator and plastic canopy. For full-scale plans send 50 cents to MECHANIX ILLUSTRATED, Fawcett Bldg., Greenwich, Conn. Specify Plan M-237, Futura.

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- New, improved, ready to use, for plaster and wood.
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- Dries fast, anchors firmly, sands easily.

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- Fills holes, cracks, other defects in furniture and woodwork.
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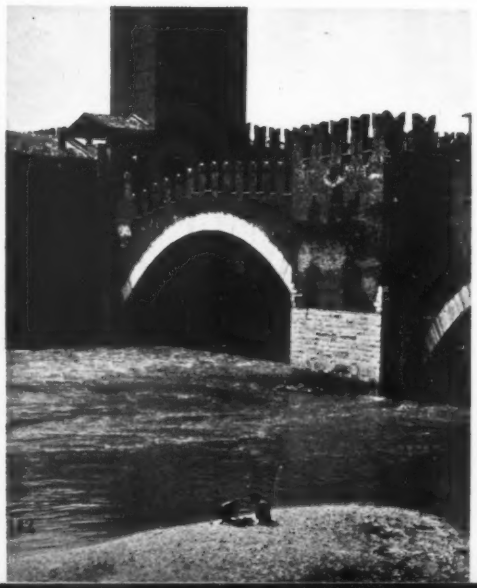
MONTHLY PHOTO CONTEST



1st Prize ($25) .....AUTO MENAGERIE
Wacky woodland carful was posed by R. D. Barrett-Lennard, London, Eng. Taken with a Leica; f-6.3 at 1/200th.

($10) .....ROYAL FISHING
Charles Frick, Fredericksburg, Va., caught this bit of Italy with a Voigtlander Vito-B; f-11 at 1/125th.

Please put your name, address and picture-taking data on back of each print. Wrap with cardboard stiffeners and enclose a self-addressed stamped envelope or postage for return of unused photos. Prize-winning pictures are not returned. Judges are MI Editors. Duplicate prizes awarded in case of tie. Address entries to: *Mechanix Illustrated*, Photo Contest, 67 W. 44th St., New York City 36, N. Y.

($10) SECOND THOUGHTS
Giovanni Massara, Biella, Italy, took this picture with a Rollei; f-3.5 at 1/8th.

($10) .....KEEPING POSTED
Industrial shoreline was shot by Harry Eisenberg, Bronx, New York; f-4 at 1/100th.

Portraits

WITH A THREE-DOLLAR LENS

SOFT AND SILKY portrait of a pretty girl is unretouched. The $3 eyeglass lens was wide open.

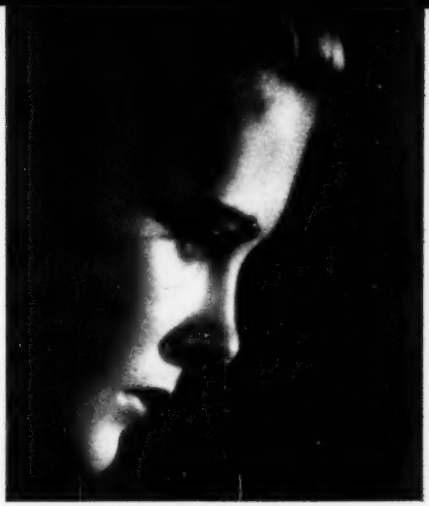
Professional portraits with an eyeglass lens? Yes—and they won't have to be retouched!

By Joseph Foldes

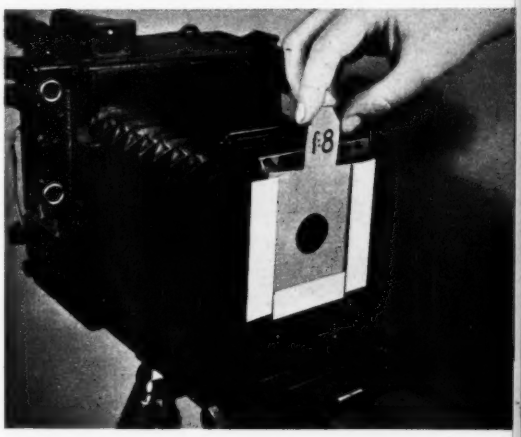
MODERN, expensive camera lenses make pictures so sharp that you can count the hairs on a person's head. It's a great achievement, technically, but what about the picture? Photograph an architectural subject and that cutting sharpness may be fine but use the same lens for a portrait of a pretty girl and the usual reaction is, "It makes her look too hard; she's better looking than that." There's no doubt that soft, smooth pictures of subjects such as pretty girls or delicate flowers are much better than needle-sharp images.

If you have a Speed Graphic or any camera with a ground glass and a removable lens board, you can take pictures with that soft, smooth effect by using an ordinary eyeglass lens in place of your camera lens—and it will cost only about $3 at the local optician.

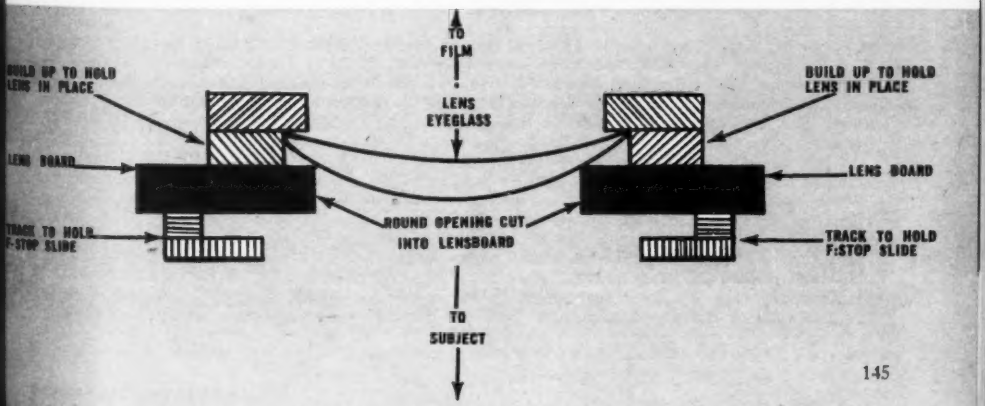
Since the strength of an eyeglass lens is expressed in diopters, you must order it that way from the optician. To illustrate, a plus one diopter lens has a focal length of about 40 inches. This means that it will focus a sharp image of a distant object on your film when the lens to film distance is about 40 inches. Therefore, to figure out the strength of the eyeglass lens you want, divide 40 by the focal [*Continued on page* 148]



LENS softens those hard lines and harsh shadows that detract from natural beauty.



LENS BOARD in place with f-stop slide inserted; lens, of course, is on inside.



Golden Hammer Award Winners

BASEMENT WORKSHOP is fully equipped, well-planned layout of William Fields, Lima, O.

The following craftsmen have been awarded GOLDEN HAMMER TIE BARS for their projects: J. C. Black, Mobile, Ala.; P. K. Leberman, Locust Valley, N. Y.; R. M. Farmer, Vandalia, Ohio; Norman Adams, Celoron, N. Y.; Harold P. Pavitt, Valencia, Pa.; Harold E. Gordon, Windham, N. H.; Leemer G. Cernohlavek, Praque, Neb.; Dennis Toscano, Medford Mass.; James Stull, Columbus, Ohio; Arthur J. Johnsen, New Hyde Park, N. Y.; Paul R. Hiquet, Salem, N. J.; Ernest J. Blake, [Continued on page 170]

Each craftsman whose project is shown receives a 24-karat gold-plated Hammer and a Workbench Award Certificate. Runners-up will be sent a beautiful gold-plated Golden Hammer Tie Bar or MI's Certificate of Merit. So send us some *black-and-white photos, with negatives,* and a full description of your latest project. Photos of your workshop are also eligible. Send all entries, with return postage, to MECHANIX ILLUSTRATED Golden Hammer Awards, 67 West 44th St., New York 36, N. Y. Entrants are advised that MECHANIX ILLUSTRATED cannot accept responsibility for customs charges, duties, taxes, etc., levied against Golden Hammer and Golden Hammer Tie Bar winners outside the United States.

RANCH-TYPE HOUSE was designed and built by E. W. Gray, Garland, N. C., who did all work except the wiring.

ANOTHER BABY ACE! Built in 28 months at a cost of $1,000 by Austin Burns, Hazlet, N. J., it cruises at 95 mph, has logged seven hours.

PINT-SIZE "CORVETTE" powered by an old lawn mower engine was made in six weeks by Al Schenker of Girard, O., for his young son.

DETAILED etched-in-glass paintings and whittled figurines are the special talents of artistic Elbert Poff, Mullens, W. Va.

BASEMENT DEN represents a full year of renovation work by Stanley Fredrickson and wife, Garden City South, N. Y. Stair well enclosure with storage cabinets and the bar area are shown above. Except for eight-inch power saw all work was done with hand tools.

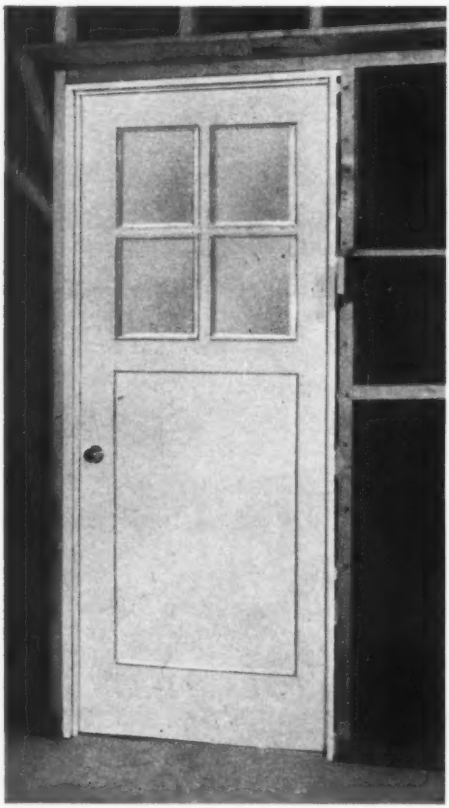
Extra Garage Door

[*Continued from page* 116]

You are now ready to set this frame in place. Nail it to fit the door and adjust it to the studs by the usual method of shimming with tapered shingles. The door is then set aside while the shingles are first nailed in place, then cut off flush with the jamb on each side; use a hand saw for this.

To finish the job, apply weatherproofing (caulking compound) along those surfaces of the frame which lie against the stucco, then nail on the outside trim.

After hanging the door, painting it and installing the lock—why, relax . . . I mean, that's it. •



COMPLETED DOOR as viewed from inside the garage. The convenience of an extra garage door will repay this weekend labor many times.

Portraits

[*Continued from page* 145]

length (in inches) of the lens you want. The result will be the plus diopter strength of the lens you have to buy. Thus if you want a camera lens with an eight-inch focal length, divide eight into 40 and the result is five. An eyeglass lens of plus five diopters will make a camera lens of eight-inch focal length. It's as simple as that.

To mount your lens, and a slide to give you the proper f-stop, you'll need an extra lens board. (One for the Speed Graphic costs about $1.20.) Then you must cut a hole in the center of the lens board, making it a little smaller than the diameter of the lens.

Your exposure time is controlled with the focal plane shutter of the camera and your f-stop, of course, is controlled with the slides. These slides can be made of cardboard and you can make as many as you want. To figure the size of any f-stop opening, just divide the focal length of the lens by the f-stop you want. The result is the diameter of the hole you should cut in the center of the slide. Thus if you have a lens with a focal length of eight inches, and you want to have a lens opening of f-8, the diameter of the opening in the slide will have to be one inch. Each slide should be marked with the f-stop it represents.

You can control the soft effect of the eyeglass lens by varying the opening. With full opening (that is, without any slide in front of the lens) you get the softest effect. Both portraits used in this article were taken at full opening. The smaller your opening, the sharper your pictures will get. At f-32, we've taken pictures to rival those taken with much more expensive camera lenses. However, the opening used with an eyeglass lens should not be less than $\frac{3}{16}$-inch diameter. In any case, you'll want to utilize the softness of your eyeglass lens, so most of your pictures will be taken with the lens wide open.

That's all there is to it. Run right out and get that eyeglass lens. You'll be glad you did. Not only will you get pictures with a pleasing effect but you'll be able to eliminate the need for retouching on portraits. Blemishes or minor flaws will disappear in the diffusion—and that's a lot more than three dollars' worth! •

The Amateur Telescope Maker's Page

A six-inch Newtonian telescope of superb quality made by an Air Force officer.

CAPT. POWELL collimating the finder of his telescope with the main field. Note detailed machine shop work in evidence.

ADJUSTING the prism so that it reflects the light rays to the eyepiece. "Spider" holds the prism which is also adjustable to center prism in middle of the tube.

IF you're fascinated by the sight of satellites in orbit or the moon's craters you might follow the example of Mather AFB Captain James V. Powell, assigned to the 3535th Navigator Training Squadron. That is, if you're handy with tools, well versed in theory, and have the energy to spend in a lengthy project.

After completing a course in astronomy at the University of Minnesota in 1949, Captain Powell vowed that some day he would own a telescope. Not the ordinary kind, but one powerful enough to view the heavens.

Making good on that promise to himself has taken seven years, but Powell is now close to realization. With the assistance, knowledge, and moral support of his co-members in the Sacramento Valley Astro- [*Continued on page* 170]

THE GRINDING STANCE. This is the familiar pose which thousands of MI readers have taken to build a reflecting 'scope.

[*Continued from page* 106]

can be drilled all the way through for bolts and nuts.

The side frames, axles and crosspieces can now be assembled. Cut and flare the pieces and tack weld them, using a try square to make sure they're aligned. Add the axles to the frame ends, squaring up the assembly as it progresses. Note that the front axle is rotated slightly in the side frame ends so that the kingpin axis has a 7° rearward slant. The frame-axle assembly can now be completely welded at all joints. As the last step, add the diagonal crosspiece at the rear.

The front wheel spindle units are made up next. Cut the kingpin bushing tubes to fit snug inside the brackets. Then weld the wheel spindle bolts to the sides of the bushings. Follow this by welding the spindle steering arm pieces to the bushings. Note that right- and left-hand units are required since the steering arm pieces slant inward.

The steering and seat hoops are now formed and cut to fit onto the frame. To make the curves, apply heat and bend a little at a time so that the tubing will not deform. Tack weld the hoops in position after clamping them at the proper angles; then complete the welds. Next cut the belly pan and seat back to shape, checking the pieces against the frame for correct dimensions. Tack weld the belly pan in place on the bottom of the frame and then skip weld the pan edges to the frame. Welds should be about one inch long and two inches apart. Where the pan touches the crosspiece at the steering hoop rosette, welds can be used or the sheet and tubing can be drilled for self-tapping sheet metal screws. To prevent the sheet steel from buckling during welding, use a chill block clamped about a quarter-inch from the edge along the area to be welded. The chill block can be a piece of ½x1x24-inch steel bar stock. The seat back is skip welded to the front of the seat hoop in the same manner as the belly pan. Make half-round cuts to clear the side frame tubes. Sissy rails can now be bent to shape, fitted to the sides and seat hoop and welded in place.

The steering assembly is made next. Cut and drill the steering shaft support brackets of ¼x1-inch strip steel. Bend the steering shaft front end and drill it for the tie-rod bolt. Then bend the yoke to shape. Put brackets and collars on the steering shaft and weld the yoke to the shaft end. Next slide the shaft through the top bracket to spread out the collars and weld the bracket to the underside of the hoop curve. Hold the lower end of the shaft at the proper angle to align the top bracket while welding. Finish by sliding the shaft into position and welding the front bracket to the top of the front axle.

The tie-rod ends are threaded for about one inch to match the Heim ball end fittings. Clevis end or Ford brake rod ends could be substituted if the ball ends are not readily available. Adjust the rod ends at the center to align the wheel spindles at zero degrees. Toe-in or toe-out can be adjusted later when the kart's running qualities have been checked. While working on the front end, weld the pedal pivot bolts to the side frames.

Drive and engine mount parts are next on the list. The wheel hub is first fitted with a large washer for bolting on the large sprocket. This permits removal of the sprocket if different sizes are to be fitted. (If you do not wish to bother with removal, the sprocket can be welded flush to the wheel hub inside face.) The large washer and sprocket are drilled for mounting bolts. Disassemble the wheel to make welding on the hub easier. The large washer is welded to the hub $\frac{3}{16}$-inch from the inside face so that the hub forms a shoulder for centering the sprocket. Weld the washer from behind, aligning it carefully so that it and the sprocket will track without any wobble. After assembly, mount the drive wheel and sprocket on the axle. Next bolt the engine to the mount plate, install the clutch (if used) and the chain. Now carefully align the chain and sprockets, moving the engine and mount on the frame. When set, mark the position and clamp the mount plate to the frame. Then remove the engine and wheel and weld the mount plate to the frame. The engine mounting bolts should be in the center of the slots so that the engine can be shifted to correct for wear on the chain

Build MI's Kart

and sprocket.

The spot brake is made and installed next. Detail drawings are self-explanatory, but follow this procedure for mounting on the axle: mount drive wheel on axle; mount brake on pivot bolt and tube; clamp brake firmly to sprocket in "brake" position (this will position pivot tube on bottom of axle tube); then clamp and weld pivot tube to axle.

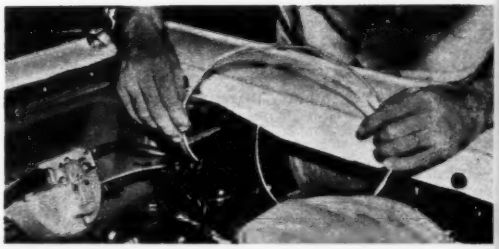
The throttle linkage is made next. Cut out and drill all parts shown on the detail drawing. Then put the engine in place on the mount so that the upper linkage parts can be aligned with the engine throttle. The brackets, rods and cranks can be assembled by brazing. Complete the throttle and brake linkage by making the pedals and push rods. Note that there are right- and left-hand pedals. Remember to slide the fairleads and stop tubes onto the push rods before bending the S ends. Rods can be fitted with clevis ends if desired so that adjustments can be made. Fit one end of the rod to the brake at the rear and put the pedal on the other end. Next put the pedal on the pivot bolt at the front, clamp the fairleads to the side frames and braze them in place. Braze the stop to the rod ahead of the fairlead with the brake off and clear of the sprocket. The throttle push rod and pedal are assembled in a similar manner. Last, make and install return springs on both pedals.

This completes the metal work on the kart. All welds should be wire brushed. Welding splatters and braze flux should be chipped off all metal surfaces and the metal cleaned before painting. It's a good idea to clean up the welds during fabrication for easy access to the tight corners.

The Clinton engine, of course, is not the only one which can be used; West Bend, Briggs & Stratton, Continental, Power Products and McCulloch engines fill the bill with slight mount modifications. The builder who wishes to customize his kart will find such items as mufflers, drum brakes, chromed tanks, steering wheels and racing slicks available from the many kart manufacturers. You can add whatever your pocketbook will allow—but simple or dressed up, the MI kart is a kartload of fun. •

Install An Ammeter

[*Continued from page* 133]

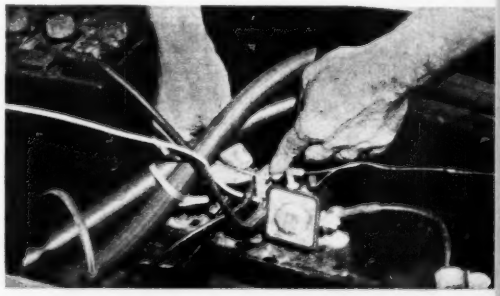


TWO LEADS from meters go through the fire wall; if necessary, 7/16-in. hole is drilled.

field winding, a defective battery or a defective voltage regulator.

The voltmeter constantly shows battery voltage. With everything off, it normally reads about 12.6 volts. Yet the voltage drops, varying with battery condition and temperature. For instance, on starting, near 80°F, it drops to about 11.6 volts. Near 32°F, it may drop as low as 9.6 volts. But if it ever drops much lower at the temperatures stated, it indicates a battery in need of recharging. If recharging doesn't help, the battery may be defective. In order to recharge, the generator voltage must be higher than that of the battery. Thus, under normal driving conditions, the meter will read between 13.8 and 14.8 volts, depending upon battery condition and voltage regulator setting.

Instructions with the Knight-Kit explain readings and adjustments. It's quite clear and simple and adds up to carefree driving. •



CONNECTION of leads to binding posts on starter solenoid terminal completes the job.

Faster Than The Wind

[*Continued from page* 97]

appeared on this side of the Atlantic, on the Hudson River at Poughkeepsie. After the Civil War organized racing entered the picture. The Poughkeepsie Ice Yacht club was founded in 1861, followed a few years later by others in the same region.

The iceboats of those days were huge, clumsy beasts that required practically a gale to get anywhere. Their sail areas were tremendous, totalling 1000 square feet and more; the distance from bow to stern was as much as 50 feet. And they were expensive.

Ice boating in America was turned inside out in the beginning of the '30s. The Depression-Baby iceboats had a single steering runner near the bow, with the other runners aft, where they supported most of the stress of the mast as well as the human cargo. Before that the steering runner had been aft. A single sail replaced what until then was the customary sloop rig. Everything became smaller. One hundred square feet of sail area with a boat length of 20 to 24 feet became popular. The new iceboats began to win almost all the regattas, and they are still with us. A popular club boat nowadays is the Skeeter —cat-rigged with 75 square feet of sail.

The major parts of the modern iceboat, with some typical dimensions, are: the backbone (stem-to-stern plank) of hard wood such as Sitka spruce, 22 feet long; the transverse runner plank of the same material, 15 feet long; the runners at both ends of the transverse plank (spring steel with a V-edge, held in a brace of aluminum) varying from three to four feet in length; a shorter rudder or steering runner of the same construction; rotating mast of Sitka spruce, 21 feet high; and a cotton or nylon sail, 75 square feet in the triangular section, several more square feet up to the after edge.

For complete streamlining, many iceboats have fuselages with one or two cockpits. But a simple oval platform on the rear of the backbone usually suffices for the captain to sit or lie on.

You can build a small iceboat for as little as $50. The DN ice yacht made by the Remi DeBlaers Company, 1548 Liberal, Detroit 5, Mich., comes in assembled or kit form, at several prices ranging from $250 to $450. The DN's are small iceboats, smaller than the Skeeters. Yankee Class iceboats, which are Skeeter size, are made by Orchard Shoal Associates, 3895 Hyland Blvd., Staten Island 8, N. Y. They cost $942 for an unassembled kit, $1,542 for the complete boat.

Although entire families cannot ride in small modern iceboats, watching Dad race is great fun. And loyal supporters can walk out to the starting line to help send off the family entry. Of course, the big thrill comes when you yourself are moving a mile a minute, an arrow in a spray of crystals. Your week-day worries have become white shadows. Only one question bothers you: when's the next Ice Age? •

McCahill Drives A Kart

[*Continued from page* 72]

from blindness) is the accumulation of too many calories. This is one sport where a good little man can beat the spots out of a good big man any day because the latter's low power-to-high-weight ratio becomes an extremely important factor. With all other conditions equal, a good 80-pound kid could cream any Indianapolis driver in a kart race—and if you own a kid of eight or more who couldn't trim me in a kart you ought to reserve a rubber room for him at the funny farm; he's nuts.

Kart racing has grown so rapidly that there are some hazards which may pop up. The biggest danger, as I see it, is in too much speed through hopping-up. A smart mechanic like Smokey Yunick could probably add 15 mph to any kart without even trying, just by reworking the engine. There are now a lot of skillful boys going into the kart business, including Frank Kurtis, who has built the majority of Indianapolis winning cars for some time. If the day comes when karts are really fast, because the boys have started mixing "fuel" (nitro) and raising compression ratios to the point where 100 mph on a big job will seem backward, karting will no longer be a sport for the average guy.

At really high speeds, a kart is not the rig to be in, as the driver is as vulnerable as a lone strawberry in a herd of goats. If I had anything to do with running kart races, as the boys started making them

faster I'd keep lowering the maximum displacements. So far kart racing is a thoroughly fun sport that is just as safe as playing golf—and I hope it stays that way.

The kart I tested was a Norseman Thunderbolt, built by the Rocco Products Co. of Minneapolis. It was delivered by Bill Herbst, the Allentown, Pa., distributor, assisted by Bud Krause, an old-time stock car driver. Finding a place to run was pretty simple. In fact, we made the test on John Van Sant's Doylestown Airport. When the kart arrived, George Forman of sports car fame was at my house. He, Jim McMichael, my Labrador Retriever Boji and myself headed for Doylestown with the T'bolt in the rear of a station wagon. Two anemic guys can load a kart into a station wagon with less effort than it takes to run a slot machine.

My Thunderbolt was a two-engine model with an overall length of 62 inches and a wheelbase of 50 inches. The height without the rollbar (which came up to the middle of my skull), is a big fat 16 inches. When I was aboard, the clearance was practically non-existent. The tires are 10.3" in the front and 12.4" in the rear. The wheels have Timken roller bearings, rated a lot sturdier than those on some of the earlier models.

Each of the two engines displaces 5.76 cubic inches and develops 4.5 horsepower at 5000 rpm—or a total of nine horsepower! The engines in my job were built by the Clinton Engine Co. and were two-cycle, similar to an outboard, but air-cooled. Each engine drives one rear wheel via a chain. The kart's frame is of 1¼", 14-gauge tubular steel, in the best race car tradition. The fuel capacity is one gallon.

I made a number of initial runs in a small section of the airport—about 40 by 100 feet. The acceleration was pretty fantastic and got me up to better than 30 mph in a very short distance. I found that the kart's steering was quicker than a riverboat gambler dealing an ace off the bottom of the deck. My only disappointment was I didn't have a place to let this thing really fly out. I was told by Bill Herbst that even with the cog it had, the kart I drove could easily top 60 mph. So I ordered some new cogs from the factory for really high-speed running.

After we finished at the airport, Bill Herbst crated the kart and we shipped it off to my house in Florida where I'll really wring it out on the Daytona Speedway, possibly next February. So hold the phone and we'll report from there later. Anyway, in the time I had it on this small airport strip, I had more fun than I've had driving in a good many years. When you get the hang of spinning this rig (which can be done easily with a quick jab of the brake and a quick flip of the wheel), you're really having a ball.

This Norseman Thunderbolt has foot-controlled accelerator and brakes which, unlike the ones on some karts, really stop you. They are big contracting jobs, one for each rear wheel. This kart of mine may be a little too hot for young kids (in fact, I *know* it is) but with only one engine it could be safe for a tot. One thing I'm sure of, though, after spending some time with this vehicle, is that the kids who get their initial driver training by running a kart on a controlled circuit stand an excellent chance of becoming much better big car drivers than their old man when they get the keys to the family barouche at some later date.

Karting duplicates every big-car condition in miniature—skids, slides and all types of control situations that few adult drivers ever get the chance to experience. It's my prediction that the kids who learn in karts will have the best highway safety records in years to come when tooling the Detroit products. In the meantime, they'll have a ball—more fun than they ever dreamed possible—and so will you when you try to outsmart the rest of the pack on the local track. From this moment on, you can put me down as a dyed-in-the-wool kart fan. •

1960 Plymouth

[*Continued from page* 88]

than before, which means a better ride over sweeping bumps and a little less harshness in potholes.

The sun visors are full-length and not the skimpy doily-size usually found in this class car. The instruments are extremely easy to read with the exception of the speedometer, which is one of those gadgets that fills in squares as the speed progresses.

[*Continued on next page*]

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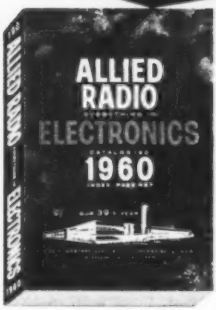

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Some might enjoy this gadget; it's not to my liking.

Bill Newberg, Executive Vice President of Chrysler Corp., personally conducted me on a tour of the plant to show how the new bodies and chassis are treated to fight corrosion and deterioration. Past techniques in most manufacturing plants called for a fast undercoat job which might or might not cover all vulnerable spots. This year the Unibody Plymouth (meaning frame and body) is dipped in several vats containing various chemicals for pickling and treating (if you haven't had a pickled Plymouth lately, you haven't lived). This means even the insides of the doors and under the seats and floorboards have been treated to fight rust and dusting away. Now this may be of no great importance to a guy living in the middle of the Mojave Desert or Death Valley but for cars used near salt water or in cold climates, where the roads are salted heavily in winter, it can mean at least double body life before shrapnel-like holes will appear.

The '60 Plymouth is what is known as an Engineer's Car—many of its virtues will go unnoticed by the casual buyer. The big payoff on a Plymouth comes when you put it on the road. With its torsion-bar suspension (the finest in the industry), it can drill through hard bends and switchbacks as adroitly as many top-rated sports cars. The ride is as comfortable as anyone could hope for.

It was hotter than a fire-eater's breath when I arrived at the Chrysler Proving Grounds one lonely Sunday morning to make a pre-introduction test of the new line. While a lot of guys were sleeping it off in church, we were buzzing the Chrysler track at better than 100 mph, looking for weak spots in the 1960 bucket. If some of my clergymen readers (and I have some, believe it or not) are wondering what I was doing out there on a Sunday, let me hasten to explain that it is the one day the track is freed of all traffic by Chrysler's own test crews and the only time I could have the entire multi-million dollar plant all to myself.

My test Plymouth was equipped with the big Golden Commando engine displacing 361 cubic inches—slightly less than a Hoboken beer parlor. This year Plymouth has several options to choose from in

power plants, including the new "SonoRamic Commando" V8 which, they claim, generates its own supercharged effect. The ram effect comes from two scoops just behind the radiator core, so that forward motion through the air builds up pressure on the way to the carburetor. Actually, this is more or less the old ram principle used at Indianapolis when I was still wearing short pants. The SonoRamic Commando is a real big ball of wax, displacing 383 cubic inches and has, by an odd coincidence, specifications identical to the Dodge Super 500 D. We didn't test the SonoRamic as it wasn't available but it should be hot enough to singe the hair on the statue of Sheridan's horse.

The plain Golden Commando torpedo, without the boost of ram-jam, can whizz out 0-60 mph in 8.2 seconds and top 120 mph almost as fast as you can say it. At Daytona, this rig with the bigger engine and ram-feed should go like Halley's Comet on a missile chase, if the boys have their gear ratios figured out right for a change. However, without getting into this bigger mill, the regular Golden Commando is quite a lot faster than any stock model Chevrolet or Ford, which means we can look for big things from Plymouth at Daytona Beach this winter.

Plymouth is also very pleased this year with its brand-new OHV in-line Six. This pot of bolts is laid over on its side at 31 degrees for a lower hoodline and possible better center of gravity. This type of mounting is now featured on some Mercedes and was a real big deal when Studebaker had it on their Indianapolis cars almost 30 years ago. As you probably know, in the last 12 months the demand for six-cylinder rigs has been the strongest in many years, especially by those who are tired of rising fuel prices and declining gas mileage.

As a possible buyer, though, you may not be interested in high-speed performance or any of the other technical facts we've just pointed out. So let's consider the Plymouth as just an automobile. What have we got? I remember the time I borrowed a Plymouth last year while my Imperial was being serviced. My companion on a ride was Jimmy Carmine, former president of the Philco Corp. and later

[*Continued on next page*]

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During the course of the trip we took, Jimmy remarked to me, "You know, Tom, this damn little car, for all practical purposes, is just as comfortable as the Imperial. I can't see why anyone would want a better car than this." I must admit I was forced to agree with him. The 1960 Plymouth has top performance and excellent suspension, which means the best cornering and roadability properties. It's comfortable and I like the looks. That just about wraps it up. •

Mercy Mist

[*Continued from page 77*]

Corps officer had flipped a switch 55 seconds ago. A scarcely visible mist fills the chamber. Now the low hum of a motor and the officer's tense counting are the only sounds in the room.

"Four, three, two, one . . ."

The switch is turned again. The motor stops. The Congressmen stare, unable to believe their eyes. Animals which had frisked about in the glass chamber only a minute before are now quite still, frozen stiff in awkward postures, *absolutely paralyzed.*

"Are they dead?" someone asks in hushed tones. "Was it some kind of poison gas?"

In answer, the officer uncaps a substance even more startling in its implications—an antidote. In less than two minutes the paralyzed test animals are romping about, completely recovered. And even without the antidote all effects of the paralyzing mist would have worn away naturally within 30 minutes!

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What is this "mercy mist" that cannot be seen or smelled but which paralyzes almost instantly? The exact nature of the chemical is a closely guarded secret. But it can be said that it is also being tested as a pain-killer, a thousand times more effective than any analgesic known to medical science today.

It is not difficult to imagine what the mercy mist sprayed over a battlefield would mean in terms of saved lives. In certain tactical situations it would insure victory without casualties—either ours or the enemy's!

True, the "unwritten rules of war" prohibit the use of gas. But with the development of the paralyzing mist and other mercy weapons, the day may not be far off when the nation which relies on the rifle, missile or atom bomb will be guilty of violating rules of humane warfare.

Mercy weapons are just one development in the tense, world-wide competition in the entire field of CBR—Chemical-Biological-Radiological Warfare.

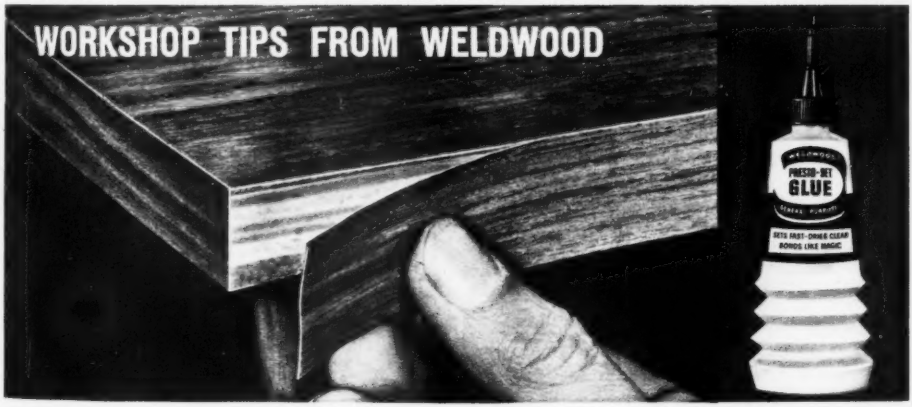
While Communist charges that the U. S. used germ warfare in Korea were completely false, it is obvious that both this nation and the Reds are working on potent new gases, disease bombs and other CBR materials. Toxic agents ten to 50 times more powerful than anything available even a few years ago and nerve gases which can kill whole populations on contact are being perfected and stockpiled.

These are the weapons no one likes to talk about. The White House recently approved a new National Policy governing the use of CBR—but no one without top secret clearance knows what this policy is.

Nevertheless, the men who guide the defense policies of the nation must be tough-minded and prepared to meet any eventuality, including the full use of CBR. Facing the facts coldly, they find:

Most CBR weapons can't be seen, heard, tasted or smelled—ideal for surprise attacks. They are also cheap in terms of both dollars and lives. A field commander wouldn't have to risk nearly as many of his men in combat since a single soldier can carry a vial capable of affecting huge areas.

[*Continued on next page*]



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Marlite® plastic-finished paneling

ANOTHER QUALITY PRODUCT OF MASONITE® RESEARCH

CBR can be used to soften up an enemy through subversion and sabotage long before the first bomb falls. U. S. authorities ran one test recently in which a portable generator was disguised in a brief case and nonchalantly left near a ventilator in a building. In another test a cloud of particles was dispersed from an apparently innocent vehicle on a road several hundred yards from a building. Of course, harmless substances were used in both experiments. But the tests clearly demonstrated that by these means an enemy agent could strike almost everyone within the Pentagon, the White House or any other building he chose.

Other experiments have been carried out from ships lying off-shore and from planes flying over the continental U. S. Once again, a harmless tracer material was used which proved, according to officials, "that coverage up to several thousand square miles could be achieved with the population being wholly unaware that the attack had occurred."

Here are some other CBR weapons under development:

A potent new itching powder which could keep the enemy busy scratching away while our troops are busy infiltrating his lines.

V-Gas—its effect on the digestive system can best be compared to the reactions of a nervous landlubber on a stormy ocean crossing.

Giggle gases. By the time the enemy's laughter has stopped he'll be behind barbed wire with a POW sign on his back.

History is full of examples of military developments which found their greatest application in times of peace. Perhaps it is not too far-fetched a dream to foresee the day when gas—long feared as one of mankinds most vicious creations—will be put to work in the cause of humanity.

Car Doctors Wanted

[*Continued from page* 101]

their appreciation of his work from time to time to the nearby car factory. Kurt's friendly and competent approach was studied by a factory official one day. His transfer to the service department payroll of the manufacturer came not long after

and he is now an assistant general service manager.

Those are dramatic examples. The more prosaic ones abound. There are any number of sales jobs, with substantial earning potentials, which especially welcome men with bench background. Jobbers of automotive parts like them; so do the parts and accessory makers. There are continuing openings as insurance adjusters and claim examiners for men who have the practical experience to handle them.

The fellow who wants to run a gas station can make good use of a background of auto mechanics. Then there is always the opportunity of moving up in the establishment where you start. And the profitable possibility of opening your own shop stands directly ahead for any competent mechanic.

You may be asking yourself if you really have an aptitude for the job. Here's a little test you can give yourself:

1. Do I like to putter around with mechanical things?
2. Are my health and stamina good?
3. Do I understand simple blueprints?
4. Am I patient in my work?
5. Did I take basic science and math in high school?
6. Do I understand basic mechanical principles?
7. Can I roughly sketch out illustrations of those principles?
8. Can I explain them easily to others?
9. Do I get along well with people?
10. Am I good with hand tools?

Now if you answer Yes to the first five questions, or even to four of them, the chances are that you could take training as an auto mechanic and pass the course.

If you can answer Yes to the last five—even a qualified Yes for a few of them—you may be potentially a foreman or supervisor or instructor.

If you think you have the aptitude for the job, there are other things to consider. You'll have to be willing to wind up the day with a dirty face and hands. You'll need the patience to keep learning. You'll have to cope with customers who come in with a chip on their shoulders. In many larger cities you will likely find yourself joining a union—the Machinists or Teamsters or Auto Workers.

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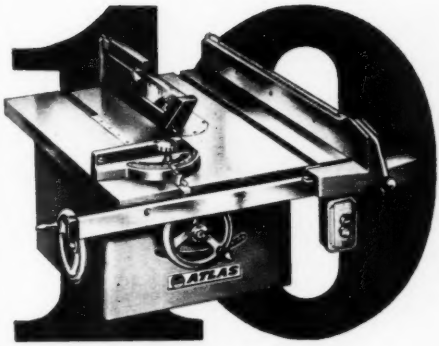

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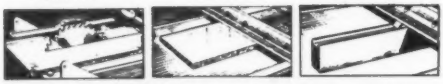

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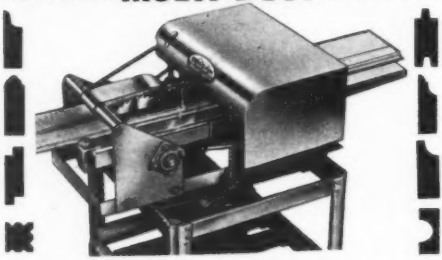

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If you get your first job in a small town, your wages will begin around $50 a week or so; if you begin in a metropolis (assuming you've had adequate training) you will start off at $80 or $90. From there on it's up to you and the size of the town. Some expert auto mechanics earn as much as $15,000 a year.

The basis for earnings varies. In the smaller towns, again, some garages are apt to pay a set weekly wage. Others, and most auto dealerships in these towns, pay on a "flat rate" basis. So do most establishments in the larger cities.

The flat rate dealer or garage owner, that is, charges a certain amount for the labor on a specific job—say $7.50 to replace a Bendix starter drive. Of this "flat rate" the mechanic will generally get 50 per cent, sometimes 60 per cent—that is, $3.75 or even $4.50 for this particular job.

A good man will insist on (and obtain) a guarantee from a new boss. A beginner can hardly expect any such concession.

What's the best way to get started as an auto mechanic?

One basic way is to study the trade in high school. High schools that don't offer mechanic training courses do almost always give manual training. And in woodworking a youngster learns how to use tools. He will learn about blueprints and diagrams and the basic elements of construction. Meanwhile, he should be taking science and mathematics to the limit of his ability.

But many men have finished high school before they've awakened to the opportunities in auto mechanic work. What about them?

[*Continued on page* 162]

Steam-Powered Tugboat

This model replica of the Esso Honduras was designed to run on steam power, but the plans also show an alternate installation of a battery-powered motor. Instructions and full-scale plans can be obtained for 50 cents from MECHANIX ILLUSTRATED Plans Service, Fawcett Building, Greenwich, Conn. When ordering specify Plan No. M-229, Tug Boat.

These Karts Go, Go, Go!

[*Continued from page* 68]

motors of the half-pint buckets, into which a standard-size adult can't pour himself. For the uninitiated, a sub-midget is a little race car with a body on it. Since Pop can't race a sub-midget himself but may spend a fortune on souping it to go faster, it follows that Junior is going to race every Saturday even if he'd rather be off collecting butterflies.

For young or old, karts are superb driver-training tools. The beginning driver can run one at two mph and learn all the fundamentals of handling a four-wheeled vehicle in complete safety off the public streets. Then he can increase his speed and become expert in the finer points. The basic 2½-hp kart has a top speed of about 38 mph. A five-hp model will zoom up to about 50 mph and some of the big twin-engine jobs can hit 65. With this kind of performance kart drivers have an opportunity to master high-speed cornering techniques that ordinarily can be learned only in full-scale racing. Karts are capable of phenomenal cornering and, with a low center of gravity and a wide tread-to-wheelbase ratio, they're very hard to turn over.

Finding a place to run these rugged, rapid and very noisy machines is the biggest problem. The surface should be fairly smooth because most karts are springless. In Mexico karts are actually used for small-cost, big-fun street transportation, but in the U. S. they are not licensed for use on public roads. Most cities probably don't have ordinances against their use on sidewalks but it would take a highly co-operative neighborhood to accept their noise and speed without a very loud squawk. Consequently, school grounds, parking lots and unused air strips are used by most karters for their outings.

The Go Kart Co. went all out and on a total investment of only $15,000 built in Azusa, Calif. a true road-racing course, scaled down to kart size. It has 20 ft.-wide asphalt pavement, is four-tenths of a mile long, has seven left-hand turns and four right-handers, one of which is steeply banked. The longest straightaway is 345 ft. and the faster karts approach 50 mph

[*Continued on page* 165]

Go Kart

Prices start at
$129.50

Get into karting, the family fun sport, on the finest and *safest* yet — the new Go Kart 400c with dual, internal expanding brakes, for safe sure stops at no increase in price over former models. Go Kart Manufacturing, orginators of the sport and volume producers of the industry sets the pace. Go, Go Kart!

fun on wheels for every one!

Enduro Models as low as
$119

Karting on two wheels is a fast rising past time with a practical side. The Go Kart Cycle, in two models, is easily carried in car, boat or plane for emergency transportation. Same high quality as the four wheel kart.

For more information on Go Kart 400c or Go Kart Cycle send 25¢ for postage and handling, and you will receive a colorful brochure on all Go Kart products. Component parts are available for those who wish to construct their own karts. Any kart crated and shipped anywhere in U.S. (est $10.00 send 25¢ balance C.O.D.

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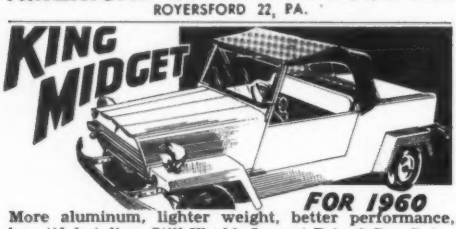
KING MIDGET



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GUNK CHICAGO CO., River Forest, Illinois
serving the Midwest and Southwest
RADIATOR SPECIALTY CO., Charlotte, No. Carolina
serving the East, Southeast and far West

Car Doctors Wanted

[*Continued from page* 160]

Any number of cities run night schools offering a wide variety of trade courses. Call the Board of Education in your town to ask about them.

Then there are the privately operated trade schools. There are some 403 technical schools around the country listed in a standard reference book on the subject, Lovejoy's Vocational School Guide. Check your library.

The scope, length and cost of such courses vary most widely. Some run for two or three months; at least one is 21 months long. Cost of such courses may range from $6 per month to $800 for the course.

If there are no nearby schools—or even if there are—correspondence courses offer a worthwhile avenue toward learning a trade. Reputable correspondence schools such as those advertising in MI offer a complete variety of auto mechanic training courses.

For men who have already entered the field, there is a kind of postgraduate, specialized training available. First, there are the training schools of the automobile companies themselves. Some have training schools in the cities where their factories are located. Others have training programs carried on in the field, as at factory branches and warehouse depots.

Electric Auto-Lite Co., as an example, offers a three-week course at Toledo in operating and maintaining automotive electrical equipment; Delco-Remy Div., Anderson, Ind., has one lasting two weeks. Other firms offering special courses are Sun Electric, Allen Electric, General Motors, Carter Carburetor, Bear Mfg., DeVilbiss, Barrett Equipment and others.

To get into any of these schools, first write to clear up questions of tuition charges, eligibility, etc. Customarily there is a tuition fee, often paid by the student's employer, in addition to living expenses.

Don't be fooled by reports that today's mechanics (and, even more surely, tomorrow's) are and will be little more than replacement men. Unless he understands what makes the various parts tick, and what is apt to grow wrong with them, he will be hard put to diagnose automotive

trouble. The best man is usually the man who can listen to a car, drive it, then put his finger on the trouble. That's the kind of knowledge that earns confidence, customers, high pay and a feeling of pride in one's work. •

Fishing Through The Ice

[*Continued from page* 74]

be sold.

On Lake Champlain, smelt fishing draws the biggest crowds. Good anglers catch from 30 to 40 pounds a day. Excellent catches of other fish are also taken through the ice in this 120-mile-long lake, including panfish, walleyes and great northern pike. In some states it is also legal to catch trout, muskies, bass and whitefish all winter.

In spite of bitter cold, sometimes —40°F, the shanties are surprisingly warm and comfortable. I've sat in them on subzero days, with a wind howling outside, and felt warm enough to shed my coat. Most shanties are homemade. The popular size is built to accommodate four anglers, with seats for two on either side and holes drilled in the ice at each angler's feet.

I suggest that you rent your shanty the first season. If you build your shanty, you must drill your own fishing holes. You'll need a good ice chisel or you may hire someone with a power drill. Then you must keep the holes from freezing over by pouring in a little kerosene or alcohol.

Tackle is also easy on the pocketbook. Fishing with artificial lures is replacing minnows, cut bait and worms. This does away with tip-ups, underwater reels, and the time and nuisance of getting live bait and keeping it healthy in zero weather.

I see a lot of homemade tackle on the ice these days, from simple hand lines for jigging, with line wrapped around a small piece of wood called a jiggle-stick, to workable spinning outfits. Many ice fishermen are fashioning short rods by sawing off the butts of old fly rods just above the first guide. For fishing the tiny ice flies and panfish lures, they use the limber extra tips of glass fly rods. To both they add cork grips and the usual sliding rings to hold the spin reel. You can rent outfits in some shanty towns for $1 a day and up—without the lures, of course.

[*Continued on next page*]

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What lures should you buy? You don't need many. Ice flies seem irresistible to all panfish. The most effective are the rubber-legged maribous, golden spiders, painted optic minnows, midget spoons for crappie, bluegills and perch, and the tiny bucktail jigs—but all on the market will catch fish.

For big game fish, spoons and large jigs are taking terrific tolls of heavy fighters as are some spearing lures, fished just off bottom. I find it a good idea to buy lures in a tackle shop near where you plan to ice-fish. These stores usually carry the lures that are taking the most fish locally and are glad to give you a lot of very helpful advice.

Of course, there are secrets to good ice fishing. First of all, when locating a spot for winter, look for a bar or shoal, preferably near a weed bed or rocks and with a sharp drop-off into deep water. If the fishing is tops there during late fall, it is likely to be excellent during the deep freeze. Cut a couple of holes and give it a try as soon as the ice is thick enough to support you. By such prospecting you should have a dandy spot all picked out when the ice is thick enough to support your car and your shanty. Haul it out, drill your permanent holes and you're in business for a long winter of fun and excitement.

Fish close to the bottom. Walleyes usually feed within a foot of the bottom; northerns about four or five feet up, unless water is very shallow; brook and brown trout right along the bottom, except in water more than 20 feet deep. Lake trout are usually in deep water but quite a bit up from the bottom. Perch usually feed deep but are at times found just under the ice—as are smelt.

In deep water, I find a most effective rig to be one with a light sinker on the bottom, then three three-foot leaders tied at ten-foot intervals from bottom to top with the lures tied to the leaders. This covers 30 feet of water from bottom to surface and is bound to find fish for you.

Keep your lure moving up and down in a definite rhythm. This jerks the lure up for eight or ten feet, then lets it flutter slowly back till the line is once more tight. Then up again suddenly with the lure. And

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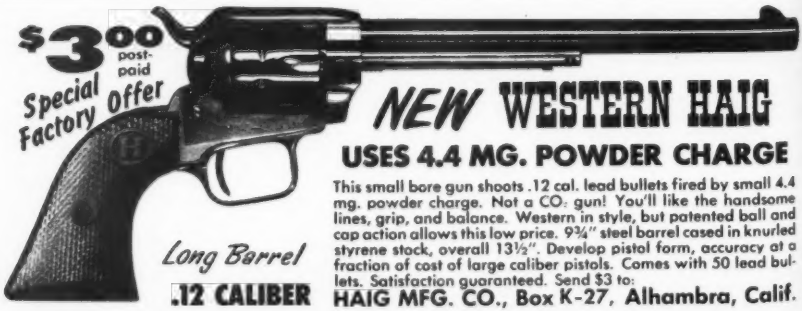

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so on, over and over. It's this fluttering down of the lure that gets the fish.

Don't get discouraged when the fishing is slow. If you're in a proven spot, sooner or later the fun will begin. But if you don't keep at it, you might miss the action.

A stout line is necessary for big pike and muskies along with a wire leader. For walleyes, perch and bluegills, which are frequently line-shy, a fine nylon leader is often necessary. For panfish, I like a 3x nylon leader at least six feet long. For walleyes, a 2x leader the same length.

Here are three pieces of clothing I consider musts: Duofold underwear, which is light but warm as a stove, cotton inside and wool outside, thermal insulated rubber boots and a pair of waterproof plastic gloves. The rest of your clothes are just a matter of common sense.

If you haven't tried frostbite fishing, drive out to a likely lake this weekend, rent a shanty and some tackle and give it a whirl—and don't forget to take the kids and the missus. Ten to one you'll all wonder why you've missed it this long.

Happy fishing now! •

These Karts Go, Go, Go!

[*Continued from page* 161]

before easing off for the curve at its end.

Last July GKCA and the Azusa Chamber of Commerce caused a new breakthrough for the karting sport by staging the first annual National Championship Go Kart Road Races at the Azusa tracks. The results were fantastic. A total of 125 entries came from New Mexico to Washington, from California to Wisconsin. Factory team entries were made by ten leading manufacturers: a group from Texas flew its teams and karts to the Los Angeles suburb in a chartered DC-3! On this big occasion—a really historic one for the sport—trophies were awarded to the top finishers in each of the three engine-size classes: up to 5.8 cu. ins., 11.6 and 16.5 cu. ins.

The National meet will be held each year on a kart course in a different part of the nation. And since the first National meet, promoters of big-time sports car road races have begun to include kart competitions in their events. Karts are here to *go!* •

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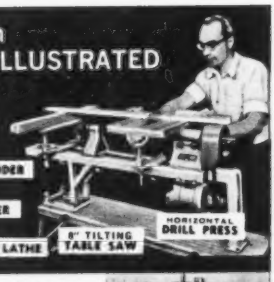

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I Rode A Navy Blimp

[*Continued from page* 80]

in the heat and the cold, so to compensate there are three little balloons, or ballonets, inside the big bag. The blimp pilot can fill any of these with air, or empty it of air, by touching a control in the Pilot's Compartment. The fore and aft ballonets are used to trim the blimp when it becomes nose or tail-heavy.

The aluminum-and-balsa car, bigger than a Greyhound bus and double-decked, is suspended by cables that go up through the bag to catenary curtains—longitudinal flaps—at the top of the bag. One of the strangest memories of my blimp flight was standing with my head poked up into a blister on the floor of that great cavern, working a spotlight around. Besides the ballonets and the cables I could see a great tube snaking upwards—that was how they climbed to the wart when necessary. The helium was invisible. It is a non-toxic gas but it affects the voices of these who breathe it; when a blimpman starts talking like a choirboy, they begin looking for a leak. Leaks are no cause for panic—the gas is under very low pressure and will not hiss out through a pin-prick. Holes, even quite large ones, can often be repaired in flight.

My blimp belonged to Airship Airborne Early Warning Squadron One—which you can not blame Navy men for calling ZW-1. ZW-1 is part of an Air Force-Army-Navy air defense system called CONAD—Continental Air Defense Command.

Commander W. F. Hartman, top man of ZW-1, drove photographer Curt Gunther and me out to the blimp from his office in a hangar building. We had been given good Navy coffee, a briefing on the modern blimp and a warning not to jump in case anything should go wrong. After Commander Hartman turned us over to Lt. Commander Al Furtek, the radar boss on the blimp, Commander Furtek gave us the same warning. They must have known some jumpy people in their time. I am no jumper myself; my technique is to hang on and shut my eyes.

All the warnings had to do with the fact that close to the ground the airship is a trickier proposition, generally speaking, than a heavier-than-air machine. Our blimp was held fast by its nose to a moor-

ing mast and moved in the sharp wind like a big weathervane. To get aboard we hopped from the apparently moving concrete to the apparently stationary ladder behind the forward wheel of the tricycle.

In the Pilot's Compartment we were introduced to Lt. Commander Robert Bowser. We watched the ground handlers haul away the mooring mast with their Mule—a very maneuverable tractor built for towing these bouncy balloons. Then we made an airplane-style take-off. The sensation, to anyone used to taking the Friday night plane to Squaresville, is nothing special. Blimps take off and land like planes, only they use very little runway.

A tour of the car revealed the radar room, full of men busily watching scopes and sending messages. Behind that—all right, *aft* of it—was the engine room. It was deafening in there; the engines are in the car, though the props they drive are on outriggers. Twin Pratt & Whitney 700-hp engines shove the blimp forward. The blimp can carry enough gas to feed these modest mills for days. If necessary the blimp can be free-ballooned to a landing.

Behind the engine room was the convenience. Impermeable paper bags are used and then simply tossed off the Back Porch or Observation Deck. "But not while we're over land," said Commander Furtek, smiling briefly.

Aft of the convenience was the Back Porch. The rear hatch was open to the sea air and one could lean out over nothing and look down at the pine woods of South Jersey. This hatch is used at sea to take water aboard for ballast.

Commander Furtek went back to his radar and left us with Lt. Don Hartman, who was not related to Commander Hartman. Don was called Chico because of a fancied resemblance to the natives of Cuba, where he had been stationed. Chico took us up to the top deck to have coffee, try out the bunks, look into the bag and bat the breeze with the off-duty crew.

Going back to the Pilot's Compartment Chico and I paused to talk, at the foot of the ladder, about his feeling about blimps. "They're alive," he said, and explained that, like huge babies, they need constant

[*Continued on page* 169]

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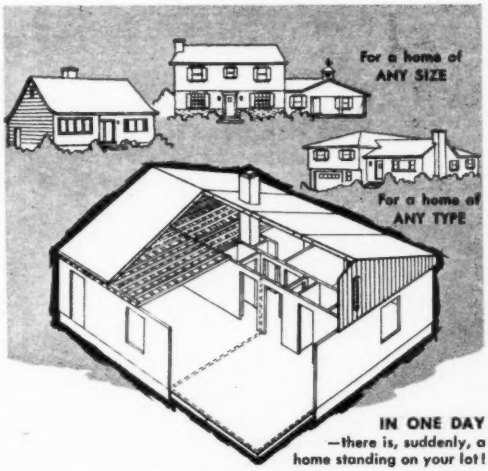

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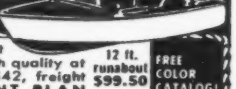

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I Rode A Navy Blimp

[*Continued from page* 167]

watching. Someone is aboard *at all times* (remember that hallowed phrase, men?) to watch the bag pressure and see that the airship doesn't break loose or hurt itself. As he talked I thought "How will I describe the difference between this motion-feeling and that of a plane?" This was more jiggly, I decided.

"Have you a burp cup?" I asked nervously.

"Are you sick?" Chico inquired solicitously.

"Not yet. This is forethought."

He brought me one of the impermeable bags. Commander Furtek appeared. He was an ex-parachute tester. I felt ridiculous. They led me into the radar room and sat me down. What could relieve me of all this Navy courtesy? Curt Gunther appeared with his awful camera.

"Come on, I want your picture flying this thing," he said.

"He's airsick," said Chico.

Curt was indifferent to my condition. I have never been more grateful to anyone. I jumped up and followed him into the Pilot's Compartment and sat down at the airplane-style controls next to Commander Bowser. I made the great ship go up. I turned her. I filled a ballonet. Somehow she tended to go up more than I intended. Commander Bowser explained that each movement of the control required a correcting movement almost equal to it. I was fascinated.

We landed shortly after that, my threatened airsickness all gone. As the ground handlers drew the blimp's nose into the big coupling on top of the mast, the airship began to frolic; she was lighter now and the wind was sharpening. She went straight up, dripping ground handlers from her landing gear; men swarmed up the boarding ladder, one of them carrying a tool kit—for extra weight, I suppose. They hung sandbags from the car to weight her down. The idea that the airship was alive got permanently stuck in my head. Curt and I came back to the New York suburbs. I haven't seen a blimp since but I think often of the ZPG-2W's on their lonely posts, and with affection. •

you can always
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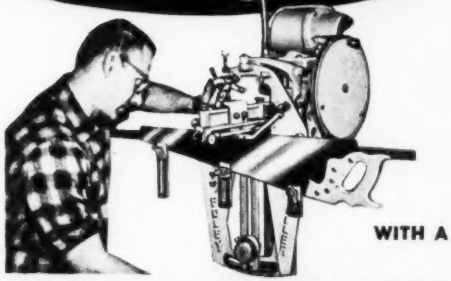

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Telescope Maker's Page

[*Continued from page* 149]

nomical Society along with his own labor and resourcefulness he has completed a six-inch Newtonian reflector.

The construction job required that the captain make most of his own tools in the process. Beginning with the knowledge gained in the university astronomy course he delved into additional books and drew on the knowledge of fellow sky-watchers.

Skills acquired in carpentry, ceramics, and wood-carving hobbies were useful in making some of the tools for his telescope. The grinding and polishing of the lens was a task which required 75 hours of work over a seven-month period. The heart of the scope, a parabolic mirror, was finally fitted into the 'scope with trembling fingers, but after viewing the moon the captain made this comment: "It was worth every bit of the effort."

Captain Powell hopes to adapt the scope for solar photography. He and a fellow member of the astronomical society have designed and are building a mechanism that will provide for automatic tracking.

Powell values his telescope at approximately $500; his estimate of expenditures for it stands at $75 to date. Assigned to the 3535th Navigator Training Squadron as an instructor in the Planning Flight, Radar 4C, Captain Powell lives at 3549 Lynne Way, Sacramento, with his wife and five children. •

Golden Hammer Awards

[*Continued from page* 146]

Warren, Mass.; Emerson Romero, Farmingdale, N. Y.; John, Alan, R. J. Quinn, Ontario, Can.; Clare F. Ringle, Flint, Mich.; Glen Page, Salem, Ill.; Richard Goodson, Jr., Toledo, Ohio; Ronald Keller, Newark, N. J.; Karl F. Stenzel, Baltimore, Md.; Mervyn E. Roberts, Jr., Utica, N. Y.; John Schwelkowsky, Elkins, W. Va.; Robert Rockenstire, Loredonville, N. Y.; Noel J. Bowser, Santa Ana, Calif.; Ernest DeMaio, Jr., Brooklyn, N. Y.; John M. McGehee, M.D., Cedartown, Ga.; David Elliot, Vancouver, Can.; Walter Zembko, Locust Valley, N. Y.; Albert L. McCann, Perry, Iowa; Frederick S. Norcross, Jr., Roswell, New Mexico; Clarence J. Kelly, Rochester, N. Y.; Marvin Shreffler, Kankakee, Ill.; John Duncan, Jr., Warner Robins, Ga.; Milford Hart, Rialto, Calif.; Ronald Bayer, Benton Harbor, Mich.; Carl Cornell, Rifton, N. Y.; William Azevedo, Berkeley, Calif.; Glyn D. Davies, Dallas, Tex.; Lewis Legley, Wrentham, Mass.; Ronald L. Thompson, New Castle, Pa.

Look for names of more winners next month.

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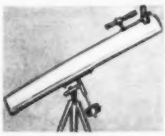

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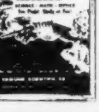

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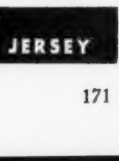

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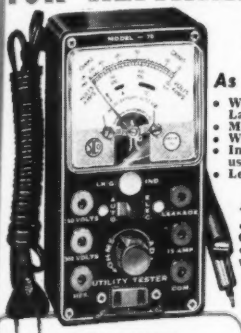

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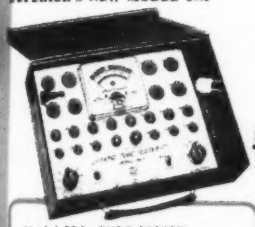

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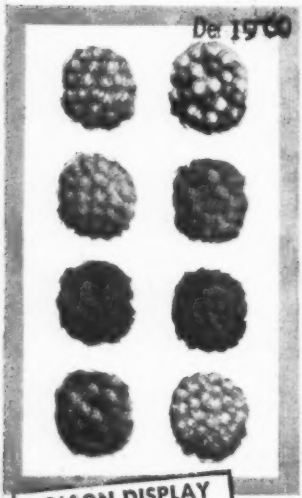

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